

THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

Published every Thursday Morning by David Williams Co., 232-238 William St., New York.

Vol. 67: No. 14

New York, Thursday, April 4, 1901.

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Single Copies, Ten Cents.

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REPUBLIC IRON & STEEL COMPANY
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Bristol's Recording
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No burning grains
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Cheap.Your Dealer has it or can get it for you.
Send for Illustrated Folder Describing the New .22 Short.

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315 BROADWAY, N.Y. BRIDGEPORT, CONN.

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See Page 134

CAPEWELL HORSE NAILS.

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are manufactured of the best steam metal, and are fully guaranteed.
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Brass Prices High So Use Bright "Swedoh" Stamp- See 186
ing Steel. Easily Brass Plated and Save Money. page 186

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Best Anti-Friction Metal for all Machinery Bearings.



Pac-Simile of Bar.
Beware of
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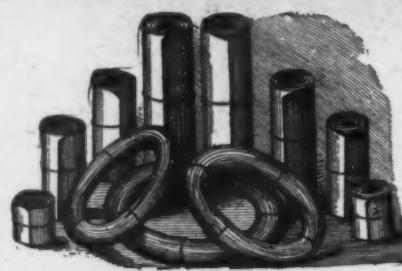
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Unshaped Casting.



No better counter made.

4 Wheel, \$3.00

5 Wheel, \$3.25

Guaranteed.

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BUY A SEAMLESS LINENOID FOR \$25.00 AND
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Sheet and Ingot Copper; Spelter, Tin, Antimony, Lead, etc.

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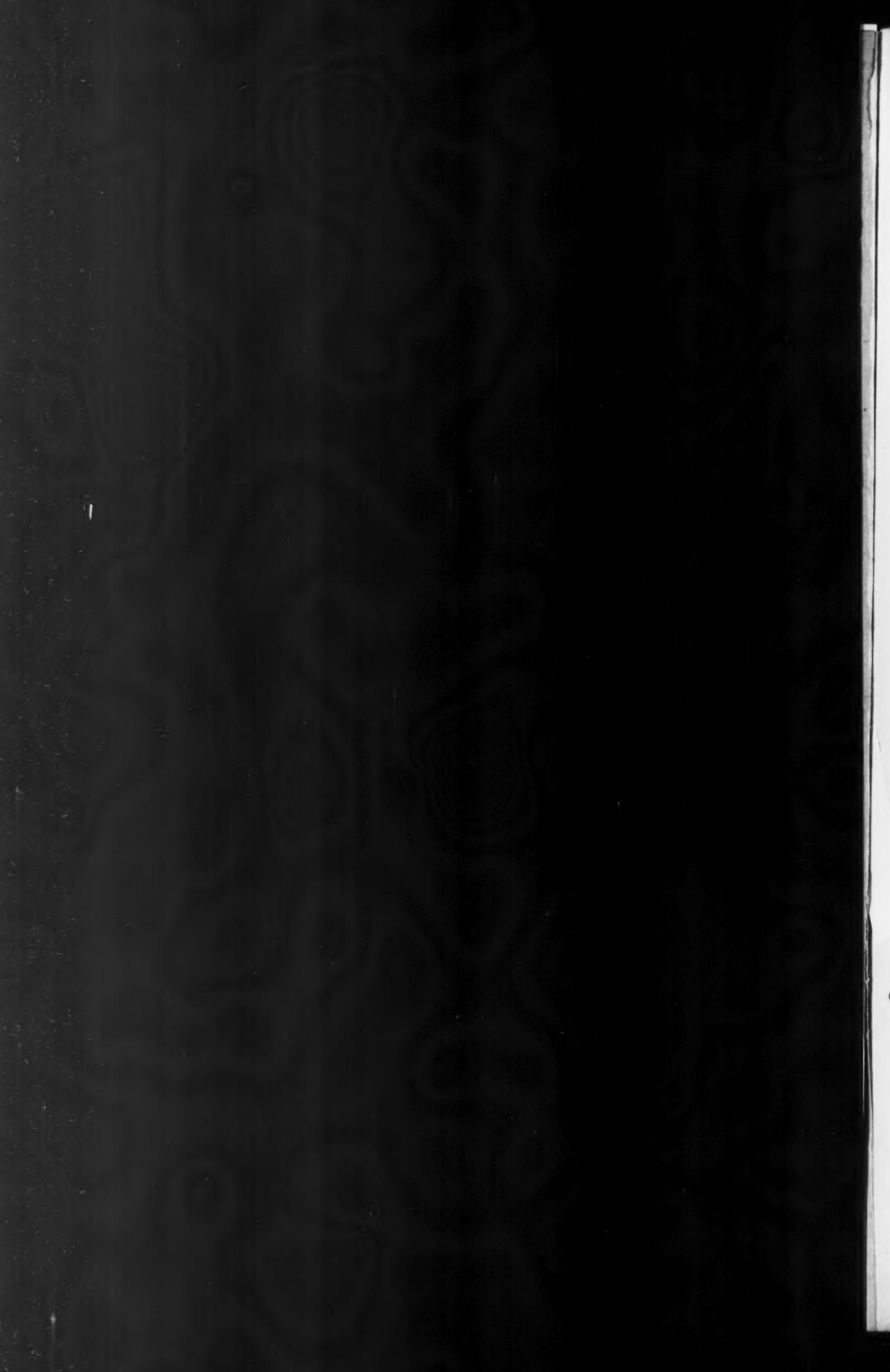
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 BRASS AND COPPER GOODS

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THE IRON AGE

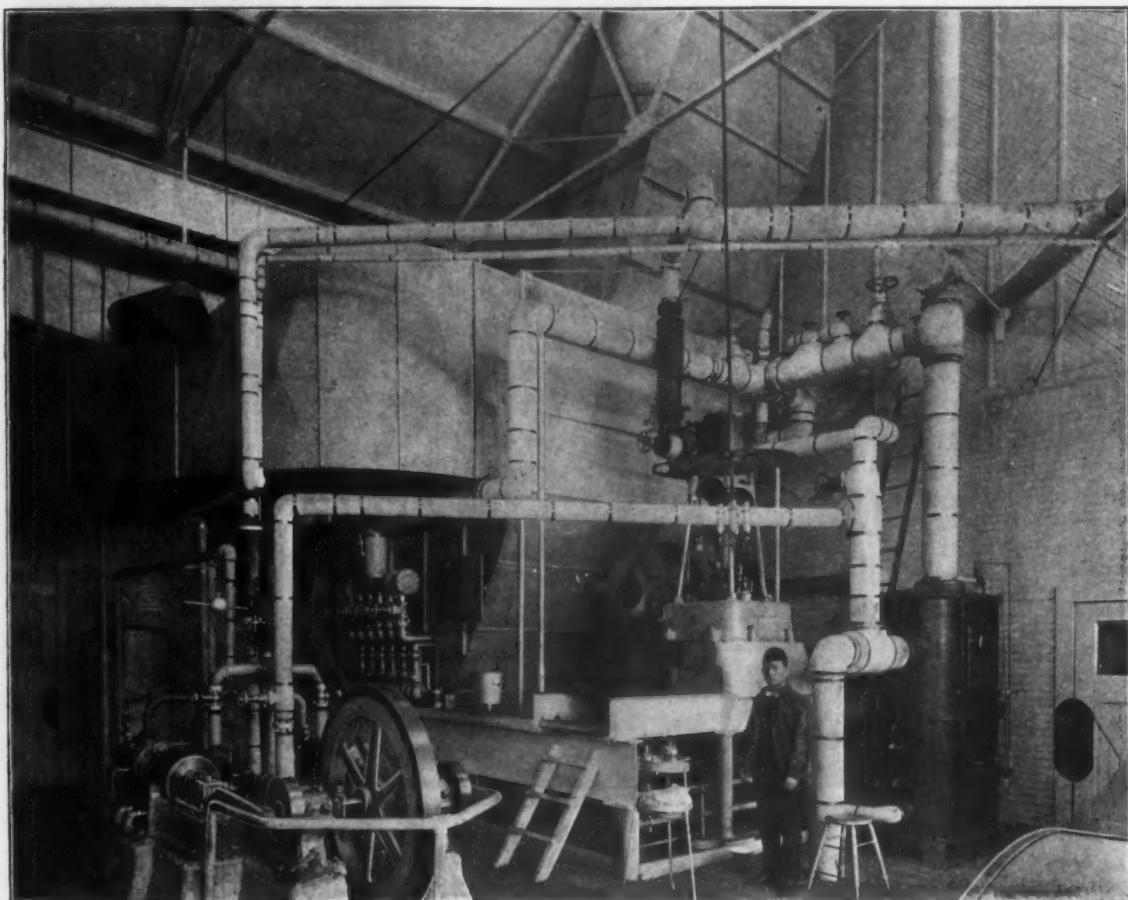
THURSDAY, APRIL 4, 1901.

The Heating and Ventilating Plant of the Boyer Machine Company.

The heating plant installed by the American Blower Company of Detroit in the works of the Boyer Machine Company of the same city possesses several features of interest. One of particular note is the arrangement of the ducts for conveying the heated air into the building. Instead of being round or rectangular in form, as is customary in such installations, they are triangular, the bottom of the pipe resting on the bottom chords of the

to deliver about 55,000 cubic feet per minute at this speed, which is sufficient to change the air in the entire building about once every 15 minutes. The amount of air handled at a temperature of 120 degrees weighs about 3750 pounds and is driven along through the ducts at a speed of nearly half a mile a minute.

The fan shaft is supported at one end by a bearing in the corridor wall. Thence it passes through the fan to another bearing attached to the fan housing, through the heater and inlet air chamber, where there is another bearing, thence through the flanged coupling to the en-



The Fan Room.

HEATING AND VENTILATING PLANT OF THE BOYER MACHINE COMPANY.

7.29/14.18
S.m. 29
roof trusses, the top having the same angle as the slope of the roof, thus making the pipes hardly noticeable.

There is a total of 846,400 cubic feet of space to be heated, the outside exposure having an absorbing capacity of 3,455,284 heat units. The temperature of the building is 70 degrees F. when the thermometer registers 10 degrees below zero outside. To accomplish the desired results there is a heater containing 11,500 lineal feet of 1-inch pipe, the coils being supplied with exhaust steam from the main engine, air compressor, pumps, fan engine, &c. In addition to this, there are 767 feet of direct radiation in the office for use when, for any reason, the blower is not in operation.

Attached to the heater is a 180-inch full housed fan, set three-quarter style—i. e., the lower quarter of the housing is below the platform supporting it. The wheel is 10 feet in diameter and is calculated to run at a speed of 175 revolutions per minute. This fan has a capacity

gine. On this shaft is a pulley, the arrangement being such that by removing the bolts from the fan coupling the fan can be run by belt instead of by the engine. The engine has a cylinder 12 inches in diameter and a stroke of 10 inches. The frame is of the marine type and the valve balanced. There is ample power in this engine to drive the fan up to 300 revolutions per minute should it be desirable.

Provision is made for drawing in fresh air through a monitor over the engine room, or this can be closed and the air recirculated through a duct at the floor of the engine room, in the partition between the latter and the machinery hall.

A movement is on foot in England for a federation of the employers' and employees' unions, in an organization to be known as the National Federation of Master Associations and Trade Unions, the object being to pro-

mote co-operation of the two interests in respect to the expansion of British trade, and to devise means to meet foreign competition.

A Summer School for Artisans.

In order to gain a more thorough knowledge of the principles of their trades many young men in industrial employments are now receiving instruction through the correspondence schools which have been established in this country within recent years, and many are being greatly helped in this way. These schools, valuable as they are, do not give personal instruction, however, nor can they offer any shop or laboratory facilities. Their students, to this extent, therefore, work under manifest disadvantages. To supply mechanics who are unable to follow any prolonged course in a technical institution with just the kind of practical instruction they need, the

tical instruction in the line of their trade, which they would not get in the shops, but it is not the purpose of the school to give the shop practice which they are expected to receive in serving their apprenticeship.

At the present time instruction of this kind can only be given during the summer term of six weeks. During the regular college year the shops and laboratories are filled with the regular students, taking the four-years' professional courses in the College of Engineering. It is possible that, if the demand is sufficient, this instruction to artisans may be organized into a separate school, under the auspices of the university, either in Madison or elsewhere, and the work given throughout the entire year in short terms of 6 to 12 weeks.

Conditions for Entrance.

At present no detailed educational requirements will be specified for entrance upon this work. Each candidate will be questioned to ascertain his fitness for tak-

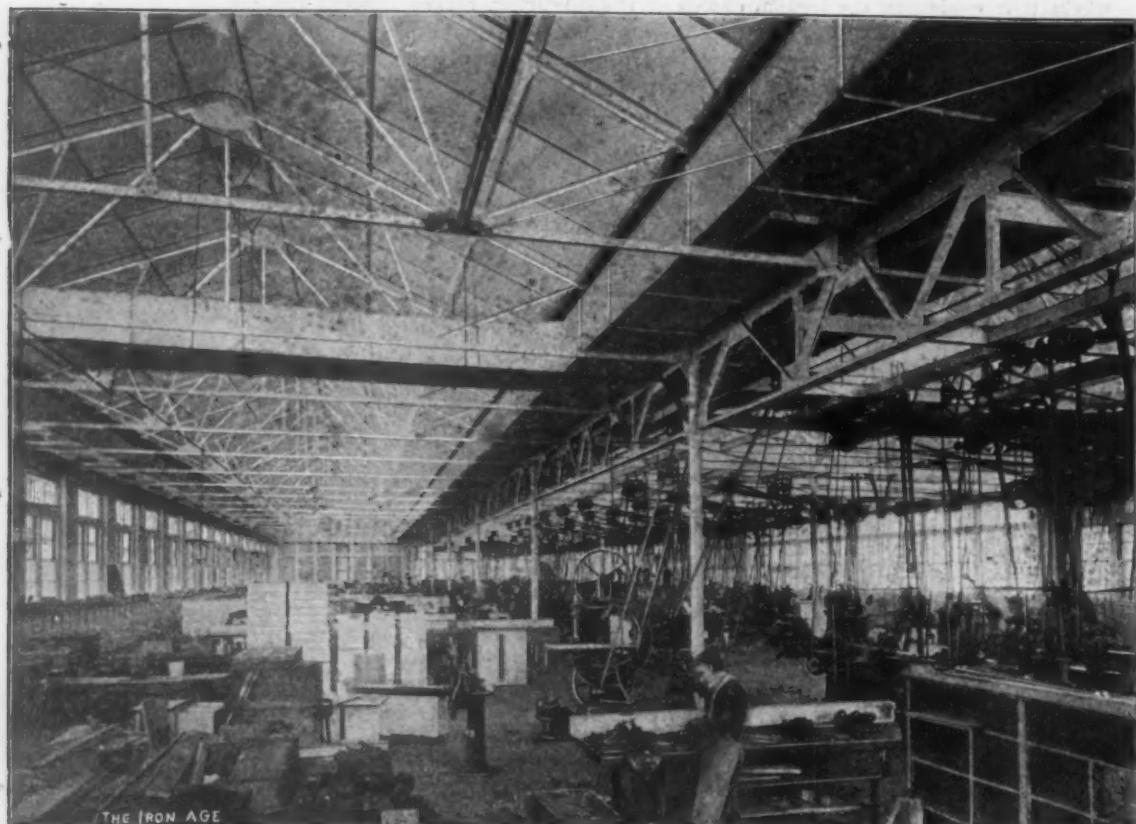


Fig. 2.—View Showing Ducts.

HEATING AND VENTILATING PLANT OF THE BOYER MACHINE COMPANY.

managers of the College of Engineering of the University of Wisconsin at Madison, Wis., have arranged to inaugurate this year a new plan of industrial education, which promises beneficial results. A summer school for apprentices and artisans has been established, which will be held at Madison during the six weeks beginning July 1 and ending August 9.

Purpose of the School.

This school is designed for the benefit of machinists, carpenters or sheet metal workers; stationary, marine or locomotive engineers; shop foremen and superintendents; superintendents of water works, electric light plants, power stations, factories, large office and store buildings in cities, and for the young men who wish to qualify themselves for such positions. For these employments the full four-years' professional courses in engineering are not required, and yet to satisfy the present demands upon this class of men it is necessary for them to obtain considerable theoretical and practical knowledge not commonly taught in any of our schools.

In the case of apprentices the purpose of the school is to give them a certain amount of theoretical and prac-

ing the work, and if it seems likely that he will be benefited by it and that he will not be a hindrance to the others, he will be admitted. A speaking and writing knowledge of the English language, and a fair knowledge of elementary arithmetic will be found necessary to a profitable pursuance of the course.

No diplomas or formal certificates will be granted to persons taking this work in the University of Wisconsin, but letters will be given by the dean of the College of Engineering stating what work has been taken and the proficiency attained.

Students in this school must present themselves on or before the opening day of the term, and they will be expected to remain for the full six weeks. Each student will be expected to elect such work from that which is offered as he desires to take, and for which he is found to be fitted, and in such quantity as to keep him profitably employed. In general the managers suggest it would be well to elect two or three lectures a day and to devote the rest of the working day in the shops or laboratories. The lecture periods are one hour each, and the shop and laboratory periods are four hours each. The school hours are from 8 to 12 a.m., and from 1 to 5 p.m.

Fees and Expenses.

A uniform entrance fee of \$15 will be charged for all pupils taking this course, and in addition to the entrance fee there will be shop and laboratory fees charged at the rate of 5 cents per hour of actual total time spent in any shop or laboratory. These fees are payable in advance at entrance. The entrance fee cannot be refunded. In case of sickness, or of other unavoidable withdrawal before the middle of the term, one-half of the shop and laboratory fees paid in will be refunded. Room and board can be obtained from \$4 per week and upward.

The College of Letters and Science of the university holds a summer session at the same time as this summer school for artisans, and all the classes in this department will be open to those students in the school for artisans who can show a suitable preparation for such courses. There are, also, many entertaining and instructive lectures given in this department to which the general public is admitted and which can be attended by the students in the school for artisans without any special arrangement or permission.

Departments of Work.

The instruction given in the summer school will be divided into the following five special departments:

I. Courses in Steam Engineering.

1. Lectures on the Elementary Theory of Heat.
2. Lectures on Steam Engines and Boilers.
3. Experimental Work in Steam Laboratory.
4. Operation and Management of Engines and Boilers.
5. Gas and Gasoline Engines.
6. Traction Engines.

II. Courses in Applied Electricity.

1. Dynamos and Motors.
2. Electric Wiring.
3. Meters, Transformers and Lighting.
4. Telephone Service.
5. Electric Batteries.
6. Electric Station Records.
7. Elementary Theory of Alternating Currents and their Applications.
8. Electroplating and Electrotyping.

III. Machine Design.

1. Use of Elementary Formulae.
2. Mechanical Drawing for Artisans.
3. Mechanical Drawing for Manual Training Teachers.

IV. The Materials of Construction and Transmission of Power.

1. Lectures on the Properties of Materials.
2. Tests of the Strength of Materials.
3. Tests of Lubricants.
4. Transmission of Power.

V. Shop Work.

1. Bench and Machine Work in Wood.
2. Foundry Work.
3. Bench Work in Iron.
4. Production of Flat Surfaces and Straight Edges.
5. Machine Work in Iron.
6. Practice with the Planing and Milling Machines.
7. Practice with the Lathe and Milling Machines.
8. Forge Work.
9. Tool Making.
10. Machine Construction and Pattern Work.

The teachers in this summer school will be selected from the regular staff of professors and assistants in the College of Engineering. A sufficient number of these will be detailed to this work to provide the necessary instruction for those who attend, provided they make application before June 1, 1901.

Opportunity to Attend.

It is anticipated that many of the students in attendance upon this school for artisans will be of those who are regularly employed in responsible positions, and who cannot attend these summer sessions without obtaining leaves of absence from their employers. These employers may be individuals, or private or public corporations, but in any case they might find it to their

advantage to encourage their more studious and intelligent apprentices, workmen, foremen and superintendents to come to these summer sessions and get a better grounding in fundamental principles, as well as in the latest and most scientific practice, in their several branches of work. It is believed that it would be to the interest of many owners to send one or more of their employees to such a school every summer, in order to increase their efficiency in managing their share of the business.

Co-operation with the Correspondence Schools.

One of the leading purposes of this school for artisans is to supplement the work of the Correspondence Schools. Persons coming with a fair knowledge of the theory of a certain line of practice, could spend their entire time in the shops or laboratories if they chose, and so put into practice, or prove experimentally, the scientific principles learned from books, or in the correspondence courses.

Shop and Laboratory Equipment.

The pupils of the summer school will have all the advantages offered in the well equipped shops and laboratories of the College of Engineering. These include a large machine shop, furnished with lathes, planers, shapers, milling machines, &c.; a forging shop, a foundry, with a cupola for melting iron, a brass furnace and a core well, with all the necessary accessories; wood working and pattern shops, a steam testing laboratory, containing a number of steam engines of various kinds, gas and gasoline engine, a refrigerating plant and the necessary instruments for making accurate tests of these engines; also for coal and gas analysis, a testing laboratory for the strength of materials and electrical laboratories well supplied with exact scientific and commercial instruments with necessary appliances for accurate measurements and tests.

Persons desiring to attend this school during the coming summer are asked to make application to J. B. Johnson, Dean of the College of Engineering, University of Wisconsin, Madison, Wis., on or before June 1, 1901. In a letter of application information should be given under the following heads: 1. Age and amount of school training. 2. Amount and kind of experience in practical work. 3. The courses in the list which the applicant wishes to take.

This information should be given in considerable detail. Some of the courses referred to will be given only on condition that there are a sufficient number of students to warrant forming classes in such subjects. In case there are more applicants than can be accommodated those applying first will be given the preference. It is necessary to know by June 1 about what work will be demanded in order to arrange for the necessary teaching force.

The production of pig iron in Germany, in metric tons, was as follows in 1899 and 1900:

	1899.	1900.
Mill Iron and spiegeleisen.....	1,667,694	1,587,194
Bessemer	534,767	495,790
Thomas	4,424,052	4,780,829
Foundry and direct castings.....	1,424,732	1,487,929
Totals.....	8,051,245	8,351,742

This shows an increase in 1900 of 3.6 per cent.

The Tramways Committee, of the Glasgow Town Council has recommended the acceptance of the tender of the Lorain Steel Company of Lorain, Ohio, of 3000 tons of girder rails at £6 12s. 6d. per ton delivered, and of 150 tons of fish plates at £7.

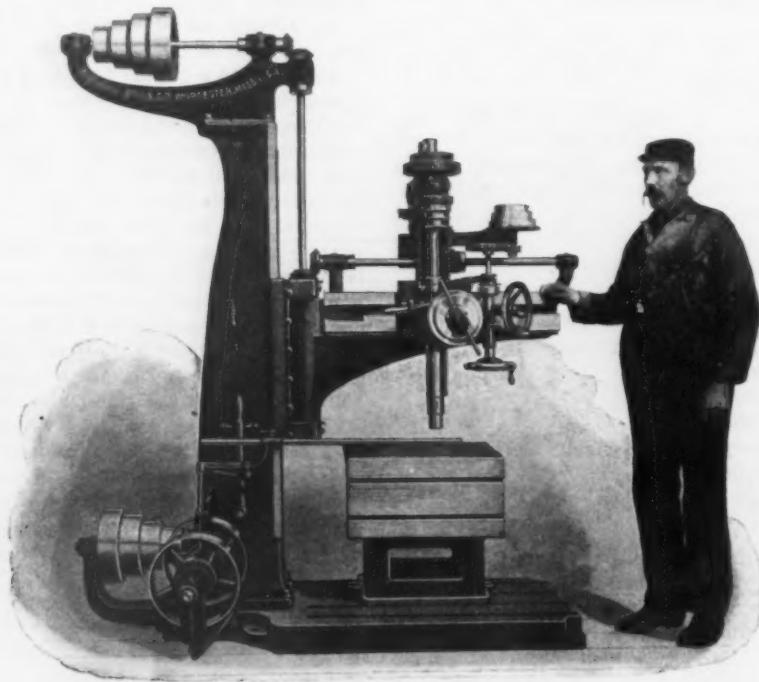
The National Tube Company have made application to the City Council of Benwood, W. Va., for the right to cross certain streets with tracks, and to have others vacated, which are entirely surrounded by property offered by the company. The report that the National Tube Company are to build two new blast furnaces and a basic open hearth steel plant at Benwood is officially denied. The company have plans for the extension of the Benwood Works, but which as yet have not been fully defined.

The Prentice Bros. Radial Drilling Machine.

The No. 6 radial drilling machine built by the Prentice Bros. Company of Worcester, Mass., is gear driven from the top shaft. Back gears are provided for the head to relieve the shafts and gears of strain. The arm swings on ball bearings, may be clamped in any position and has vertical adjustment by power. The head on the arm is moved by hand wheel, rack and spiral pinion and cannot vary its position by accident. The spindle is back geared and counterbalanced and has an improved quick return and stop motion, permitting it to be quickly returned or approached while power feeding; this also allows the point of the drill to be brought to the work and the power feed thrown in by the same lever while the machine is in operation. All the hand wheels and levers are within easy reach of the operator. The base plate is T-slotted and heavily ribbed. It is driven by friction pulleys at the back or side of the column, as may be ordered, allowing the machine to be placed at right angles to or in line with the main shaft.

42 x 61 feet; an engine room 32 x 52 feet, and a core room 32 x 60 feet. Fifteen hundred feet of track will be laid to connect with the Chicago & Northwestern and Elgin, Joliet and Eastern railroads.

A Rush Shipment.—Recently one of the two engines of a blooming mill at the Duquesne Steel Works broke down. The parts that gave way were the crank shaft, weighing 65 tons, and the jack shaft, weighing 60 tons. A hurry up order for two new shafts was given to the E. P. Allis Company of Milwaukee. Last Friday evening the shafts were ready for shipment, but they were so heavy that special cars had to be provided. The 16-wheel car specially built by the Pennsylvania Railroad Company to carry the Krupp gun from New York to Chicago, where it was exhibited at the World's Fair, and another specially constructed iron car, were hurried to Milwaukee to be used in transporting the heavy shafts. The two cars left Milwaukee Friday night, and reached Chicago Saturday morning. At 5.13 that morning the two cars were pulled out of the Pittsburgh, Fort



THE PRENTICE BROS. NO. 6 RADIAL DRILLING MACHINE.

A universal table, in place of the box table, can be provided. The main dimensions are as follows:

Traverse of spindle, 11 $\frac{1}{4}$ inches; traverse of saddle on column, 44 inches; diameter of spindle, 1 $\frac{1}{8}$ inches; hole in spindle, Morse taper No. 4; minimum distance, spindle center to column, 13 $\frac{1}{4}$ inches; to trunnion bearing, 8 $\frac{1}{4}$ inches; traverse of head on the arm, 24 $\frac{1}{4}$ inches; will drill to the center of a 76-inch circle; distance, spindle to base plate, maximum, 60 inches; minimum, 5 inches; available space on base plate, 42 x 27 $\frac{1}{2}$ inches; table, 20 x 24 x 25 inches high; base plate, 62 x 28 x 4 $\frac{1}{2}$ inches deep; floor space with friction pulleys on back, 102 x 28 inches; at side, 76 x 47 inches; weight, 2750 pounds.

Wayne & Chicago yards, with a special engine, and were started on their trip to Pittsburgh. On the train was a representative of the Carnegie Company, whose business it was to see that no unnecessary delay occurred. The railroad people themselves had orders to rush the cars as fast as possible. The train had the right of way between Chicago and Pittsburgh over all trains, save one or two fast passenger trains. Thus the train went speeding East at a rate sometimes of 45 miles an hour, arriving in Pittsburgh Saturday afternoon at 5.13 o'clock. The shafts were delivered at the Duquesne Works at 10.46 Saturday night. The distance of 450 miles was made in 16 hours and 17 minutes. In the transportation of freight this is said to be a record never before achieved.

The Sharon Coke Company of Sharon, Pa., have been incorporated. The incorporators are Frank H. Buhl, John Stevenson, Jr., James P. Whitla, all of Sharon; Wm. Flinn and Geo. W. Darr, Pittsburgh. The new company will erect coke ovens, probably of the by-product type, near their new steel works and blast furnaces in Sharon, Pa.

The American Hardware Mfg. Company have been organized at Youngstown, Ohio, with a capital of \$100,000, and will make brass electrical supplies.

American Malleable Castings Company.—Work has commenced upon the new plant to be erected for the American Malleable Castings Company. The works are to be located at Chicago Highlands, an industrial town near Chicago, lying at the junction of the Chicago & Northwestern and Outer Belt railroads. The factory is to be built of brick and steel, and will consist of a large building 110 x 540 feet, and an annex 32 x 102 feet. The large building will be divided into a foundry 110 x 300 feet, a mill room 40 x 110 feet, an annealing room, containing 14 annealing ovens, 100 x 200 feet. The annex will contain a furnace room, with two melting furnaces,

The Federal Industrial Commission.

WASHINGTON, D. C., April 2, 1901.—The Federal Industrial Commission will begin a new series of hearings on the 6th inst. with reference to industrial consolidations, including the more recent combinations of railroads and the big merger now known as the United States Steel Corporation. The hearings will extend over a period of several weeks, and will be held partly in this city and partly in New York, the commission having found it necessary to go to the metropolis in order to secure the attendance of a number of important witnesses who, while quite willing to testify, have stated their inability to visit Washington during April for that purpose.

The commission is specially desirous of securing a full and authentic statement of the circumstances and considerations which led to the formation of the United States Steel Corporation, and soon after the consolidation was announced invitations were extended to Andrew Carnegie and to J. Pierpont Morgan to give their testimony on these points. Mr. Carnegie replied in a jocular spirit, stating that he would be quite willing to deliver a lecture on golf, but concerning his views on consolidations in general, and the one under consideration in particular, he felt that he could add nothing to oral and written statements made by him several years ago, of which he inclosed copies. Soon afterward Mr. Carnegie sailed for Europe. Mr. Morgan expressed entire willingness to testify before the commission, but stated that his time was so fully mortgaged for some time to come that he could fix no date, and the commission has small hopes of being able to secure his attendance in the near future. Assurance has been given, however, that President C. M. Schwab will appear before the commission during its New York sessions, and will testify with regard to the practical advantages secured by consolidations of large manufacturing plants. The commission desires especially to have Mr. Schwab's views as to the competitive methods which the big merger proposes to adopt, and will probably propound a good many inquiries that neither Mr. Schwab nor any one connected with the big corporation has as yet completely thought out. Another point of interest to the commission is whether the merger is planning to take in other corporations in the future, and especially whether any general policy will be adopted for the absorption of other companies.

The commission is not very sanguine of gathering a large amount of positive information on any of these points, but its members feel that the opportunity of securing authoritative statements during its formative period concerning the most important consolidation in the world's industrial history should not be neglected. The records of the commission now contain very full testimony given by a prominent official in each of the important combinations in the iron and steel trade that have been effected within the past three years, which covers practically the entire period of the consolidation movement under the New Jersey laws.

In connection with the further investigation of industrial and railroad consolidations now about to be undertaken, the commission expects to take the testimony of Charles R. Flint of the United States Rubber Company, who will discuss not only the combination in the rubber industry, but the ethics of the so-called trusts in general; Jacob Schiff and James Stillman, the well-known bankers, who will testify concerning the financing of the great combinations of capital; James B. Duke, president of the American Tobacco Company; S. M. Felton of the Chicago & Alton Railroad; President Burt of the Union Pacific Railroad; President Guillaudeu of the Old Dominion Steamship Company; M. C. Markham, assistant traffic manager of the Illinois Central Railroad; R. R. Wright of the State Industrial College of Georgia; Samuel Thomas, E. R. Chapman, and others. The commission has a much more extensive list of witnesses for the May hearings, but names are withheld until arrangements for their appearance have been completed.

It is expected that the New York hearings will de-

velop an interesting feature in the testimony of certain members of the New York Reform Club, which organization has intimated its desire to argue before the commission the proposition that the so-called trusts are protected and practically supported by the present tariff. These arguments, it is thought, will be purely academic, but will doubtless serve to draw rejoinders from the interests whose affairs are discussed. The commission received an intimation some time ago that the Reform Club desired to be heard, and an opportunity would have been afforded during the present month, but for some reason the members of the club have not availed themselves of the opening, and it is now understood they will not testify until the meetings in New York in May.

In this connection much use is being made of a statement given to the press within the past week by Representative Babcock of Wisconsin, author of the free metal bill, who states that when he reintroduces this measure at the beginning of the next Congress it will provide for the repeal of the tariff on tin plate and plate glass, as well as on certain metal manufactures. Mr. Babcock explains that he is not striking at the trusts alone, but goes further and declares that if any individual "is enabled through the high protective tariff to impose extortionate prices upon the people, he is just as much an object for Congressional legislation as any trust." He adds that the Dingley act should not be set up "like a Chinese joss, something to be worshiped and never altered," and that a new and very serious problem confronts the country which must be met by the party in power. Mr. Babcock's statements are being very widely circulated in the interest of tariff revision by both anti-trust agitators and representatives of interests desiring lower duties on certain products which constitute the raw materials of various lines of manufacture.

Professor Jenks' report on the industrial consolidations of Europe, which has been delayed for certain translations, will not be made public until the conclusion of the April and May hearings. It has been intimated that the report contains references to efforts made by American and European manufacturers to bring about international consolidations, and also that it deals with the alleged practice of some American manufacturers to sell their surplus products abroad at less than the prices received for them in this country, but these statements are not confirmed.

W. L. C.

The American Can Company.

In addition to the plants enumerated in *The Iron Age* as being included in the American Can Company, the following concerns are involved. Those marked with an asterisk have merely parted with the can business, and the machinery, patents, good will, &c., in connection with the can business:

- *American Lubricator Company, Des Moines, Iowa.
- *Art Metal Company, New Brunswick, N. J.
- Baltimore Can Mfg. Company, Baltimore, Md.
- J. L. Board, Chicago, Ill.
- U. B. Campbell, Boston, Mass.
- *Champion Chemical Works, Chicago, Ill.
- *Dann & Co., Belpre, Ohio.
- *Davenport Canning & Mfg. Company, Davenport, Iowa.
- William Faife Company, Baltimore, Md.
- *A. Giesel Mfg. Company, St. Louis, Mo.
- *Gibbs Preserving Company, Baltimore, Md.
- W. C. Garrison Mfg. Company, Newark, N. J.
- J. B. Hanway, Joppa, Md.
- *Charles Josselyn and Axel Johnson, San Francisco, Cal.
- *E. T. Mason & Co., Chicago, Ill.
- Norton Can Company, New York City.
- National Metal Lithographing Company, Camden, N. J.
- *William Numsen & Sons, Baltimore, Md.
- *E. & O. W. Norton, Chicago, Ill.
- Phoenix Art Metal Company, New Brunswick, N. J.
- F. A. Robbins Press Works, San Francisco, Cal.
- Rudolph & Krummel, Chicago, Ill.
- Soehner & Dister, Dayton, Ohio.
- *W. H. Smyth, San Francisco, Cal.
- *San José Fruit Packing Company, San José, Cal.
- The Seamless Metal Ware Company, Sing Sing, N. Y.
- *George H. Tay Company, San Francisco, Cal.
- Frederick Westerbeck, St. Louis, Mo.
- Wright Jacket & Can Company, Chicago, Ill.

The Eastern Can Company, Baltimore, Md., and Louisville Can Company, Louisville, Ky., have not been absorbed by the American Can Company. The names of these companies do not appear on the official list just issued by the latter.

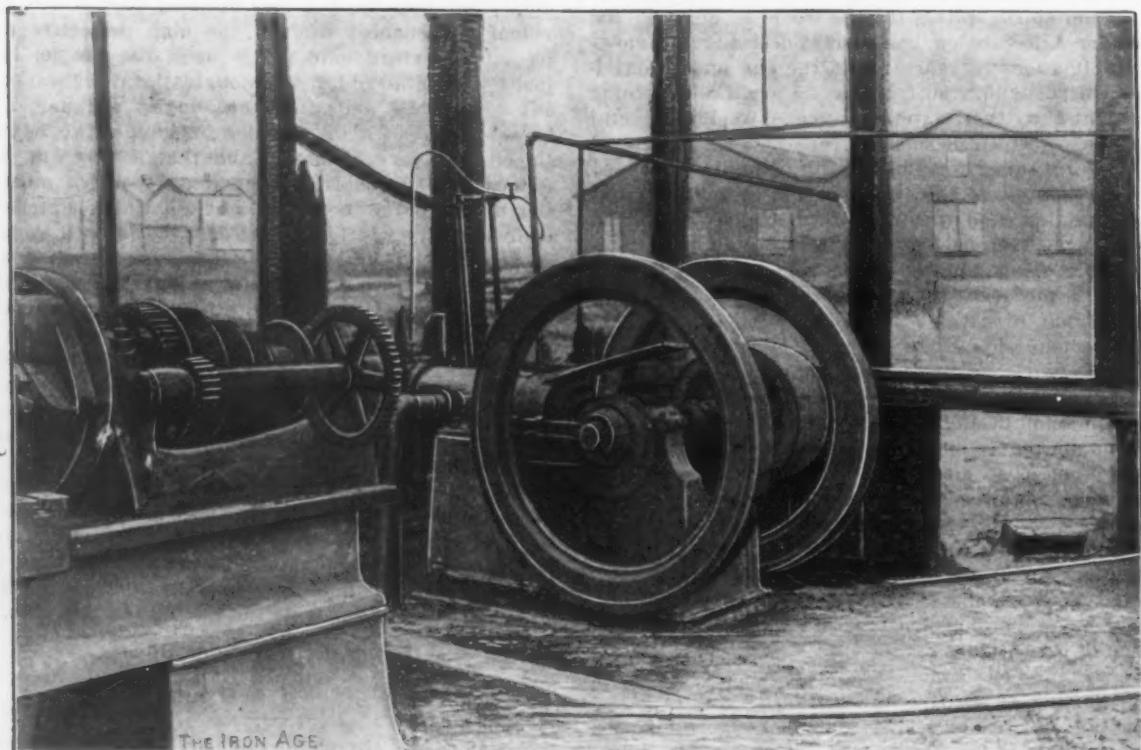
Gas Engine Passes Unharmed Through Fire.

A short time since fire destroyed the entire plant of the Ellwood City (Pa.) Gas Engine Company. After the ruins had sufficiently cooled the *débris* was removed from about one of their 18 horse-power engines, and after replacing one spring that had been burned off the engine was started. It ran at the same speed and with the same steadiness which characterized its operation before the fire, which proved that the governor had not been affected by the heat. The cylinder jacket, being filled with water, explains why the cylinder wall and piston were uninjured. That the engine was in a hot place was shown by the fact that the oil cups were entirely burned off, as well as the one spring. Had the

roads. Only Youngstown capital is interested in the company, the incorporators being George Tod, Thomas H. Wells, John Stambaugh, Jr., Edward L. Ford, Hugh B. Wick, J. G. Butler and H. G. Hamilton. All the stock has been subscribed, and all roads will have an equal footing in freight privileges. The line will run from the Ohio plant of the National Steel Company, at Girard, to the Hasletton plant of the Republic Iron & Steel Company.

Production of Pig Iron in Canada in 1900.

The production of pig iron in the Dominion of Canada, as ascertained from the manufacturers by the American Iron & Steel Association, amounted in the calendar year 1900 to 86,090 gross tons, as compared with 94,077 tons in 1899, 68,755 tons in 1898, 53,796 tons in 1897, 60,030 tons in 1896, 37,829 tons in 1895 and 44,791 tons in 1894. The statistics of the association do not go back prior to 1894. Of the production last year 70,349 tons were made with coke and 15,741 tons with charcoal. The produc-



GAS ENGINE PASSES UNHARMED THROUGH FIRE.

engine been of intricate construction it is not very likely that it would have been in condition to run after passing through such an ordeal.

Catalogues for the Patent Office.—The Patent Office in Washington desires to receive from manufacturers and publishers such catalogues, circulars, price-lists or other advertisements relating to the sciences and mechanical arts as are published by them for gratuitous distribution; notice is, however, given to such manufacturers or dealers who feel disposed to send their publications that not less than three copies should be forwarded in order that the subjects may be properly indexed, classified, and subclassified in the Scientific Library for convenient and ready reference. We are advised that manufacturers will find it advantageous to comply with this request, since catalogues and advertisements are frequently cited by examiners and held to be anticipations of claims made by supposed inventors.

Youngstown, Ohio, mills are to have an independent belt line connecting them all and making connections with the Pittsburgh & Western, the Pennsylvania, the Pittsburgh & Lake Erie and the Lake Shore rail-

tion of Bessemer pig iron, included above, amounted to 3781 tons. Neither spiegel nor ferromanganese was made.

On December 31, 1900, the unsold stocks of pig iron in Canada amounted to 12,465 gross tons, as compared with 9932 tons at the close of 1899 and 9979 tons at the close of 1898. Of the unsold iron on hand on December 31, 1900, 6900 tons were coke pig iron and 5565 tons were charcoal pig iron.

On December 31, 1900, there were ten completed furnaces in Canada and four furnaces were in course of construction. During 1900 one new furnace was completed at Midland, Ontario, by the Canada Iron Furnace Company, Limited. It was blown in early in December, 1900, and was in blast in January last. The other four furnaces referred to were all being erected by the Dominion Iron & Steel Company, at Sydney, Cape Breton, Nova Scotia. One of the furnaces was completed early in 1900 and was blown in on February 5. Another will soon be put in blast.

The boiler makers in Pittsburgh and vicinity have made a demand for an increase in wages, to take effect April 1. The demand is for \$3 a day, minimum, of nine hours.

Coal, Iron and Shipbuilding in Scotland.

The Coal Trade.

GLASGOW, March 20, 1901.—The price of coal, while still on the down grade, is not so low as it ought to be in Scotland, both in relation to the general industrial condition and to the range of prices in other markets. Wages have been adjusted on the basis of 7 shillings per day of eight hours, and this rate has been fixed by the Conciliation Board until April 30. But on their part the miners have resolved not to work more than five days per week instead of 11 days per fortnight, as was arranged when the eight-hour day was introduced into the Fifeshire collieries some years ago and into the Lanarkshire collieries last year. And this resolution, they have just announced to the employers, they propose to carry into effect on and after April 1. The coal owners of the Eastern counties of Scotland have intimated in reply that they will not consent to such an arrangement and that they will require their men to keep the pits running for 11 days per fortnight, as hitherto. Their reason is quite clear—that the trade of the Fifeshire and the Eastern collieries is chiefly an export one, which will not allow of the restriction of labor to five days per week. In effect the proposed restriction of labor will reduce the output about 10 per cent. In 1900 the output of Scotland was, as now declared, 33,112,102 tons, as compared with 31,142,012 tons in 1899; an increase of 1,969,492 tons, which closely approximates the increase in the exports from Scotland last year. The general adoption of the five-day policy will reduce the output of 1901 to, say, 30,000,000 tons, and at the same time increase the cost of production by about 6 pence per ton. Therefore the coal owners of Scotland will be unable to compete with the coal owners of the North of England (where wages are regulated by a sliding scale) for the foreign trade, and the exports from Scotland will so fall off that many pits will probably have to close down long before the end of the year. Yet this is the suicidal policy that the Scotch coal miners propose to follow, and curiously enough some of the Western coal masters are by no means unfavorable to it, for they, too, fancy that it may check a further fall in prices. The coal output of Scotland is only about one-seventh of that of the whole of the United Kingdom, and to restrict the output in Scotland can have no effect on prices unless the other districts restrict also. It is not improbable that a rupture may occur between masters and men on the subject, and then toward the end of next month the wage question will revive again, so that the prospect is gloomy. It will be a miracle if the summer is got over without a miners' strike. If there is a strike no one can predict the effect on prices. If there is no strike prices will come a good deal lower than they are at present, and at present they are 5 shillings to 6 shillings per ton lower than they were a year ago, and about 8 shillings below the top prices of last year. But Scotch coal is no longer the cheapest coal in the market.

The Iron Market.

The iron markets have refused to be stimulated by the reports of renewed activity and rising prices in the United States. The fact is that iron and steel makers have considerable difficulty in getting orders to keep their works going, and are at the moment more bent on avoiding such loss as idle plant means than in netting profits. So many furnaces have been put out of blast in England and Scotland that the inference is that there is no profit to be made out of smelting at present prices. And yet there ought to be a fair margin on the prices which Scotch smelters are now obtaining, with coal at a comparatively moderate price. There are, however, only 79 furnaces in blast here, as compared with 85 a year ago. While these lines are being written the price of Scotch G. M. B. pig iron is about 53 shillings per ton. By some people it is believed that there will be no general revival in the manufactured iron and steel trades until the price of pigs comes down to the neighborhood of 40 shillings. There will have to be a drop of sev-

eral shillings per ton in coal and of several shillings per week in furnace men's wages before that can happen, but the reductions in the price of Spanish iron ore and in the sea freight of it are in favor of cheaper pigs. Spanish ore has come down 7 shillings per ton within quite a short time, and looks like being cheaper. This means a great deal for Scotland, which is now practically dependent on Spain for ore. In 1899 the Scotch furnaces smelted 2,564,672 tons of iron stone, and only 843,585 tons of that was mined in Scotland. Last year the output of the Scotch iron mines was 849,031 tons, but most of it is of inferior quality compared with the Blackband iron stone, upon which the iron industry of Scotland was originally founded.

Whatever the prospects are as regards pig iron and whatever the probable effects of the Morgan-Carnegie steel combine, the steel trade of Scotland is dull. There is a decided feeling of disappointment that the great reductions in iron and steel prices have not brought the long expected rush of orders for new ships. Our shipyards remain fairly well employed on contracts, but they are not booking any new orders worth mentioning, and in the allied trades employment seems to become month by month less active. Finished iron manufacturers have had a fair turn of business since they reopened after the new year, but there is no great depth or breadth about the demand and there is always the feeling that such as it is may fizzle out any day.

The great hope of all in the iron trade is in shipbuilding. The world's fleets must be replenished and the world's sea traffic is constantly growing. No other nation can yet touch us in shipbuilding (you have not got your Subsidies bill passed yet), and no other shipbuilding center can beat the Clyde. If the great rush of demand for ships is not this year it will come next year, and meanwhile we must possess our souls in patience. Not that, of course, we have nothing else to do but build ships here, for our own industries are so varied that it may be said now of Glasgow as it used to be said of old of Nürnberg, that her hand goes into every land.

The Naval Programme.

The new naval programme laid before Parliament last week holds large promise for Scotch shipbuilders. In the fiscal year beginning on April 1 the Government propose to lay down three battle ships, six armored cruisers, two third-class cruisers, ten torpedo boat destroyers, five torpedo boats, two sloops and five submarine boats. And of these one battle ship, five armored cruisers, two third-class cruisers, ten destroyers, five torpedo boats, two sloops and five submarine boats are to be allotted on contract to private firms. As a matter of fact the five submarine boats are already under construction at the Barrow yard of the Vickers Sons & Maxim Company (whose projected amalgamation with the Cramp Company of Philadelphia has been so long talked about) and will be launched during the summer. But all the other contracts named have to be allotted and it means a very large amount of work for shipyards, though only the initial stages of it will be reached this year.

American readers will doubtless be interested to know how much work is already being done by private shipbuilding and engineering concerns for the Government. In the navy estimates now before Parliament there is a vote of £9,003,256 for purposes of new construction. Of that sum £8,465,406 is required in furtherance and completion of work actually on hand, and without any reference to the new work to be begun during the year under the 1901 programme. And of that £8,465,406, no less than £6,685,000 is for distribution among the private firms who are at present building for the Admiralty. This includes payment for engines built by private engineering firms for vessels whose hulls are being constructed in the Government dockyards. By far the largest proportion of that sum goes to the Clyde. The firm which will draw the largest amount here from the Admiralty this year toward payment of the work in progress are the Fairfield Shipbuilding & Engineering Company, Glasgow, whose contract installments will come to over £800,000. The following is a list of the

votes in respect of work with the principal contractors during the fiscal year 1901-2:

Contractors.	Vote in estimates, 1901-2.
Vickers Sons & Maxim, Limited, Barrow.....	£887,220
Fairfield Company, Glasgow.....	831,670
Thames Iron Works Company, London.....	702,050
John Brown & Co., Limited, Clydebank.....	600,000
London & Glasgow Company, Glasgow.....	477,700
Laird & Co., Birkenhead.....	386,060
Wm. Beardmore & Co. (late Napier's), Glasgow.....	200,000
Palmers Company, Jarrow-on-Tyne.....	261,550
Armstrong & Co., Newcastle-on-Tyne.....	170,000

In some cases these items include both hulls and engines; in others only the hulls, and there are still others, not named above, for engines alone. The following shows the distribution of the naval vote in the various centers:

Voted for—	Fiscal year 1901-2.
Clyde builders.....	£2,204,700
Tyne builders.....	740,270
Barrow builders.....	887,230
Thames builders.....	883,440
Mersey builders.....	386,060
Hull builders.....	34,720
Belfast builders.....	60,000

This gives a fair idea of the relative importance of the Clyde industry to the national defenses.

Ore for the Valley Combination.

DULUTH, MINN., March 30, 1901.—The question of ore for the combination of Mahoning and Shenango Valley furnaces is a somewhat important one. With an annual capacity for nearly 1,700,000 tons of pig iron, these furnaces will have an outside possible demand for 3,000,000 tons of ore, most of which will, of course, come from Lake Superior. At present they have no supply that is at all adequate for this demand or for anything like it. It is safe to presume that this defect will not be permitted to stand, and that these interests, when they get together, will carry on a campaign for supply, even if they have not already taken initial steps to that end.

With furnaces belonging to Pickands, Mather & Co. in the combination it will possibly carry the ore mines, the same being true of others, including Corrigan, McKinney & Co., who are far and away the heaviest ore men in the new deal. The Youngstown and Briar Hill interests hold almost a three-fourths interest in the Biwabik mine, Mesaba range, which interest is good for a very large annual tonnage. Last year it would have amounted to 693,500 tons. The mine can produce enough to make a larger percentage. The Byers estate, also included, has a long time contract with the Lake Superior Consolidated Iron Mines for an annual delivery of Adams and other ores at \$2.20 a ton, Lake Erie delivery. The annual amount on this contract is not great, but is important from the price basis. The Sharpsville, Cherry Valley, Shenango, Kittanning, Dunbar and River have no ore interests. Andrews & Hitchcock have a six-one-hundredths interest in the Mahoning, which on last year's basis would have furnished them about 50,000 tons. The Struthers Furnace Company have some undeveloped ore interests near Crystal Falls. There are now no M. A. Hanna independent ore interests. Briar Hill has certain rights to buy of Aragon, which are without especial value.

Pickands, Mather & Co. were a few weeks ago figured by me as good for more than 400,000 tons a year. More recent developments on the Menominee range and the purchase of the Curry mines on the Wisconsin end of the Gogebic make the firm's annual possibility better than 600,000 tons of excellent ores.

The big end of ores for the combination would be the mines of Corrigan, McKinney & Co., if they are, as rumored, the basis of an ore pool for the group. These mines include an annual output that can easily be put to 1,000,000 tons, perhaps more. Their Commodore and Stevenson mines on the Mesaba and their new Munroe, same range, can put out a very large tonnage; their Crystal Falls, Lincoln, Lamont, Great Western and Quinnesec mines, Menominee range, will as a whole

make a large output, though not all are active; their Gogebic interests are of the future, and they have siliceous ores in the Cascade district. In all they ought to have a production of not less than 1,000,000 tons annually, and it is probable they can make that much this year.

D. E. W.

The Higley Automatic Saw Grinder.

The Higley saw grinder, handled exclusively by J. R. Vandyck, 136 Liberty street, New York, is intended for resharpening cold metal saws. It is imperative that the saw blades of these machines be kept sharp to secure the most satisfactory results. In accomplishing this it is necessary first to preserve the form of the tooth unaltered, else, after several grindings, the blade will have to be recut, which entails returning them to the makers, involving both delay and expense; second, the exact temper of the blade must be preserved. The temper is frequently drawn in grinding dry, but as this



THE HIGLEY AUTOMATIC SAW GRINDER.

machine is primarily a wet grinder the saw is uninjured. The grinding wheel runs in a pan of water covered with a hood; by raising the latter the pan is lowered and the wheel runs dry. The grinding wheel is mounted upon an adjustable sliding carriage which is given a short oscillating movement, causing the wheel to travel to and from the blade, through a short arc. This insures greater rapidity of adjustment and work than is possible when a reciprocating movement is employed. The adjustment of the carriage also avoids the necessity of changing the position of the blade when a second cut round is desired. The saw blade is held in position over a drip table by a stud, made adjustable to suit the size of standard arbor holes and all diameters of saws within the capacity of the machine. The combination of center and carriage adjustments makes it possible to grind any shaped tooth used in cold sawing. A counter-shaft is provided with tight and loose pulleys, from which extend two belts—1½-inch belt for the grinding wheel pulley and 2-inch belt for the large pulley. This permits the speed of driving pulley of grinding wheels to be altered according to the abrasive without affecting

the feed mechanism or necessitating any change on the machine itself. The feed mechanism adjustment may be altered without affecting that of the grinding wheel, and *vice versa*. The blade is rotated by a friction clamp and held in place by a double pawl, with independent adjustments, to insure accurate, simple and safe means of presenting each, or every other, or every third tooth to the action of the grinder.

Locomotive Building in the United States.

A Statement by John H. Converse of the Baldwin Locomotive Works.

WASHINGTON, D. C., April 2, 1901.—An interesting account of the development of the locomotive building industry in the United States and the success of American manufacturers in competing with foreign rivals in nearly all the countries of the world is contained in a statement made to the Industrial Commission by John H. Converse of the firm of Burnham, Williams & Co., proprietors of the Baldwin Locomotive Works, which the commission is about to publish.

Mr. Converse states that the industry in the United States probably dates from the construction by Mr. Baldwin in 1831 of a locomotive for the Germantown Railroad. At the present time there are ten or more important firms making locomotives, the Baldwin works alone employing 8500 hands, about \$10,000,000 of capital and turning out 1200 locomotives per annum, valued at \$16,000,000 or \$17,000,000. Concerning the use of American locomotives abroad Mr. Converse says:

American Locomotives Abroad.

"The foreign trade in locomotives has been a growth of the last 40 years. At first it was confined chiefly to Cuba and South America. Of late years, and chiefly within the past 25 years, it has extended to the Eastern Hemisphere, and the growth has been very great in that direction within the past ten years; so that now American locomotives have been sent to a greater or less extent to almost every country in the world where railroads are in operation. Within the past three years we have built locomotives for railways in England and France and Southern Germany. These countries have been large locomotive producers in the past and have been our competitors for foreign trade in South America, so that it is rather a remarkable development that industrial conditions in the United States should have changed so that we are able to build locomotives for their own countries. I think there have been three reasons for the introduction of our locomotives in Europe. First, the possibility of much earlier deliveries than any European works could make. Our large capacity and facilities have made it possible for us to fill a large order in a very short time. Second, to some extent the preference for American locomotives as to their type and size and details. And, third, the question of price. Owing to the design and character of American locomotives they can be and have been constructed at a less cost per unit of weight than the ordinary European locomotives, although the wages we pay are considerably higher than the wages in European locomotive works. There are two reasons for that. In the first place, the character of our American workmen, their disposition to be industrious and their intelligence in their work; and, second, the much larger use of machine tools and improved machinery in this country than abroad. The fact that we have a very large home market strengthens us for going abroad and seeking business."

Development in Design.

"At the beginning of railroad operations in the United States the locomotive was a machine with a single pair of driving wheels, and the aggregate weight was probably not over from 12 to 16 tons. The first change was the addition of the second pair of driving wheels and the coupling of them together, and the equalization, as we call it, of the driving wheels, which was an American device. Then the next change was in coupling six

and eight driving wheels together, and the increase in the weight of locomotives from 20 to 50 tons. That change occurred about from 1840 to 1850. In the next two decades, from 1850 to 1870, nearly all the existing types of locomotives were brought out, and there was some increase in weight. About 1870 the standard American locomotives were about 40 tons in weight for an ordinary freight locomotive and about 35 tons for the passenger locomotive. The development has been very great within the past decade, and now freight locomotives of 100 tons and passenger locomotives from 70 to 80 tons are the rule. All these weights that I have given are for the locomotive proper and exclusive of the weight of the tender. The weight of the tender has proportionately increased, so that, while 40 years ago a 2000-gallon tender was considered to be a very liberal size, we have before us to-day for construction tenders of 7500 gallons capacity.

Increase in Speed.

"The increase in speed has been one of the most remarkable developments of recent years. I can remember when the technical papers greatly discussed the question whether the speed of a mile a minute had really ever been made on any American railroad, and there were those who maintained that such a story was only a myth. To-day there are trains running in the United States scheduled at a rate which means a speed of anywhere from 70 to 80 miles an hour. They actually run on that schedule, and they do it every day. Some of the fastest time made in the world is made between Philadelphia and Atlantic City. The Pennsylvania Railroad and the Reading Railroad both have their lines from Philadelphia to Atlantic City, and they have summer trains which are scheduled to make the distance from Philadelphia to Atlantic City in 60 minutes. The distance is from 55 to 59 miles, and out of the 60 minutes they have to take the ferry from Philadelphia to Camden, so that it is a record that passenger trains are run every day in the summer season from Camden to Atlantic City, a distance of 55 to 59 miles, in from 45 to 50 minutes.

Heavier Rails.

"There has been a close relation between the development of the locomotive and the introduction of steel rails of increasing weight, and also iron and steel bridges. All those elements of the problem have been found together. The introduction of steel for rails in place of iron has made possible heavier locomotives, and then the gradual increase in the weight of steel rails until to-day steel rails weighing 100 pounds to the yard are being used, whereas 40 years ago a large part of the mileage of American railroads was laid with rails weighing less than 60 pounds to the yard, and generally of iron. Cars have been increased in weight and capacity. Thirty or 40 years ago a car weighing 10 tons was loaded with 10 tons of freight, and a heavier load than that was discouraged. In fact, double rates were charged on loading in excess of a certain amount, which I believe was 12 tons, and to-day, as this commission knows very well, cars are being built to carry 100,000 pounds, or 50 net tons.

"The effect of this increase in the size and speed of the locomotive and in the substitution of steel for iron, the increase in the weight of rails and in the improvement of bridges has been to very largely reduce the cost of operating the roads, and to that fact is due the decrease in the cost of transportation, I suppose."

Quality of Material.

"We have probably more than doubled the weight of locomotives in 25 or 30 years, and at the same time have made most important improvements in the quality of material, but have done it with an increase in the price of not more than 40 or 50 per cent. The changes in the material have been the adoption of steel for boilers instead of iron; of thicker boilers and stronger boilers, made in a much more expensive and elaborate way, so as to be capable of carrying a steam pressure of 200 pounds to the square inch, whereas 30 or 40 years ago 100 pounds was the ordinary pressure. More parts are

made of steel about the locomotive than formerly; tender frames are made of steel; the tanks are made of steel; the cabs are made of steel, where they were formerly of wood. All the wheels under a locomotive and tender are steel tired, where formerly both the tender and engine wheels were cast iron. This substitution has been made possible by great improvements in the production of steel. These changes are common to all locomotive works in America, but in Europe they have not been forced to make the changes which we have in this country. Their practice has been more firmly established there, and they have adhered to their original standards to a greater extent than we have. Our American railroad system was built up largely on borrowed money and had to be developed under conditions of the greatest economy; light rails, wooden bridges, cheap structures, cheap locomotives and cars had to be used in order to make it possible to stretch the railroads that we have stretched across our Western territories; but with the growth of the country and the strengthening of these great railroad lines the roads have been rebuilt, and heavier rails and better bridges and better equipment have been substituted. The locomotive and car manufacturers simply reflect the development of the country, of its interests, and have adapted themselves to that development."

Continuing, Mr. Converse states that in extending the foreign market for locomotives some very high tariffs are encountered. In Russia, for example, the duty on a locomotive is 4 cents a pound, and is fully effective of its purpose to protect Russian manufacturers. In dealing with the Russian Government, however, his company, who in four or five years have supplied about 150 locomotives for the Trans-Siberian Railroad, did not encounter the tariff, as their contracts provided for delivery on board steamer at a Russian port. In the majority of foreign countries the railway system is largely governmental and the tariff question is thus eliminated from the transaction. At the present time, he said, it was not necessary to import material for locomotives constructed for American railroads, but in the case of locomotives for export contracts sometimes called for certain appliances or parts of foreign manufacture. Such parts are imported, and the duty paid thereon is rebated in the form of drawback when the finished locomotive is exported.

Raw Materials and Patents.

"In almost every particular," continued Mr. Converse, "we work from the raw material; that is, we buy pig iron and steel plates, steel billets, boiler tubes, &c., and make the parts from these. The only finished parts that we buy are appliances such as steam gauges, injectors, steel tires and steel tired wheels. We are practically without patent protection for any parts of our locomotives, with the exception of a plan of compound locomotive invented by Mr. Vauclain, one of the partners of the works, and which is very largely used both in America and abroad. Some of our machinery is patented, for we have found in our experience that tools can be designed and constructed to perform certain processes more economically than existing tools, and in such cases we have the tools made, and sometimes parts of them, at least, are protected by patents."

"With regard to present conditions of the business world I would say that it is very much more prosperous than at any time between 1893 and 1897, a fact which I attribute to the general prosperity of the country, the large demand for our crops abroad, the immense development of railroad transportation, the sound financial condition in which the country has been placed within the past few years, and to some extent to favorable legislation, by which I mean the provisions of law enabling us to import foreign made articles for locomotive manufacture and to secure drawback of duty on them when they are sent out of the country again. It is not a very important item, but still it is an aid in building up foreign business. It might mean a difference of 4 or 5 per cent. in the price of a locomotive, and that sometimes in close competition would secure business which would otherwise be lost. As to the importa-

tion of foreign locomotives into the United States, I only know of a single case in the last quarter of a century, and that was a specimen locomotive ordered in England by the Pennsylvania Railroad Company for the purpose of serving as a pattern of a new type and of English workmanship. Locomotives have been growing more and more alike in American and foreign practice.

European and American Locomotives.

"The principal distinction between American and foreign locomotives to-day is the use in America of the bar frame as contrasted with the plate frame, which is a feature of European practice. In American practice also locomotives are invariably built without side cylinders and crank axles very largely. These two details are now the most radical differences between American and European locomotives. It would seem that in the 100-ton locomotive we have reached about the limit of weight that the roads, the bridges and the economy of hauling cars would permit; but I am quite liable to be mistaken, and that we may see many new developments in the next 20 years.

"Replying to your question as to whether there has been any effort to combine in one corporation all the locomotive works of the United States, I would say there has been such a movement, but it has been unsuccessful so far; they could not get all the locomotive works to agree to a combination. Some of them were favorable, while others, including ourselves, were not.

"Concerning our methods of securing foreign business, I would say we have a general agency in London and agencies in Norway, Sweden, Russia, China, Japan and Southern Germany; we cover most of the European countries with our general agencies. Our business in South Africa has not been very large, but we have locomotives on the Uganda Railway and on the railway in Cape Colony, and also on the Soudan Railway. Our principal competitors are England and Germany, and to some extent France and Belgium. I believe there is a duty on the manufactured locomotive in the American tariff laws, but while it is sufficient to debar importation it is unnecessary, as the practical obstacle to the importation of foreign locomotives is the general preference for the American type of engine, the skill of American mechanics, &c."

W. L. C.

Articles Spun of Steel.

For years it has been generally considered that for spinning of various shapes no metal would work quite



ARTICLES SPUN OF STEEL.

like brass, but of recent years there has been such marked improvement in the quality of steel, particularly that produced by the Wilmot & Hobbs Mfg. Company of Bridgeport, Conn., from their Swedoh brand, and which is used largely for all kinds of pressed, stamped, drawn and spun work that the theoretical advantage or superiority of brass is fast being dissipated. The company are producing a galvanized spinning grade of Swedoh steel which, as shown herewith, has been spun up into the most difficult shapes which it can be considered as possible for brass to be formed into, the surface of which is so fine and smooth as to permit of parties seeing their faces in the burnished surface, the galvanizing, of course, preventing the rust, which has been one of the objections in the substitution of steel for brass heretofore, besides preventing the quick work hardening of the steel. It is under-

stood that the peculiar galvanized surface put on by a secret process of the company permits of an easy working and lessening of the wear and tear on the dies for drawing, stamping or spinning, which puts this cold rolled galvanized steel practically on a par with brass for many purposes.

Taxation of Corporations.

The Industrial Commission has published a report upon the taxation of corporations, prepared by its expert agent, George Clapperton. The greater part of the report is devoted to a summary of the tax system of the States of Massachusetts, Connecticut, New York, New Jersey, Pennsylvania, Ohio, Indiana, Michigan, Illinois, Wisconsin, Iowa and Texas. Mr. Clapperton says that he found the general property tax system prevailing in all the States, but that there are distinctive features in the various States which are especially marked in the taxation of corporate property. He does not indorse the system of levying a fixed rate upon net earnings, which is in vogue in Delaware and Virginia, finding that, while the system is theoretically satisfactory, it "does not meet the varied business developments of corporations."

He also finds the general property tax unsatisfactory. On this point he says: "It is clear that under this system there are numerous forms of wealth that do not and cannot be made to bear a just share of the public burdens, and which, in large part, evade or escape taxation, and some forms which, when reached at all under the prevailing general property tax, are not equally and uniformly but unjustly and disproportionately taxed as compared with other property. The inevitable result is that real estate and some forms of personality are unduly burdened with taxation."

Upon the whole, Mr. Clapperton concludes that an income tax is the most equitable, saying: "There is a growing class of citizens who receive large incomes or salaries and enjoy all the advantages of society and good government who, though possessed of abundant ability to pay taxes, are, under existing systems, practically exempt from taxation or inadequately taxed. This class is receiving, and must continue to receive, especial attention in the revision or reformation of taxing systems in the several States. While a tax upon individual incomes is generally conceded to be just and equitable in principle, it has been received with disfavor and regarded as impractical in its operation. It is apparent, however, to the careful student of commonwealth taxation that, because of its justice and the increasing efficiency of State administrative methods that are being evolved, the idea of a limited supplementary State income tax is growing in favor and coming to be more generally regarded as a practical measure under State supervision."

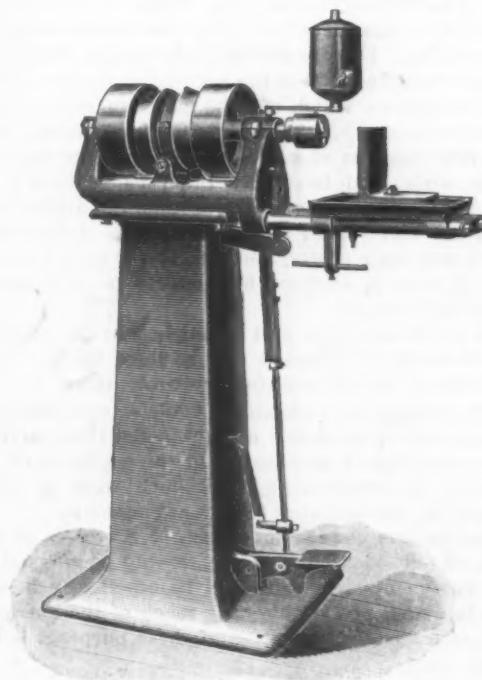
A bill has been introduced in the State Legislature to incorporate the Lower River Power & Water Supply Company of Niagara Falls. The capital mentioned is \$5,000,000. The directors named are Commodore P. Vedder, Tunis G. Bergen, William Williams, Charles E. Hotchkiss and De Witt V. D. Riely of New York; Patrick F. King, G. W. Knox and J. S. Simmons of Niagara Falls. The company seek to operate along the lower Niagara River, while the Erie Canal is also said to be their prospective field by virtue of a contract made by the Erie Canal Traction Company with George W. Aldridge, former Superintendent of Public Works of the State. The company are to supply water and electricity in any city, town or village in New York State.

There was launched on Monday, March 25, from the yard of the Columbian Iron Works, Baltimore, Md., the United States torpedo boat "Tingey." The "Tingey" is one of the group of 12 torpedo boats and 16 destroyers appropriated for by Congress in 1898. Her length on load water line is 175 feet; breadth, 17 feet 6 inches; mean draft, 4 feet 8 inches, and a displacement on this draft of 165 tons. She is a twin screw vessel, with vertical quadruple expansion engines and Thornycroft boilers of 3000 horse-power, and her designed speed is 26

knots. Her bunker capacity is 30 tons and trial load 10 tons. Her battery will consist of three 18-inch Whitehead torpedo tubes and three 3-pounder rapid fire guns. The contract price was \$168,000. The vessel was christened by Miss Anna Truxton Craven, a descendant of Commodore Tingey (for whom the boat was named) and a niece of Assistant Secretary of the Navy Hackett.

The Hubbell Horizontal Ball Bearing Tapping Machine.

The accompanying cut illustrates a machine recently designed by Harvey Hubbell of Bridgeport, Conn., for tapping a large variety of work that is not too heavy to be readily handled, such as nuts, couplings, brass, malleable and cast iron fittings, straps and castings of frames of light machines, &c. It will carry a tap from the smallest to $\frac{5}{8}$ inch; $\frac{3}{4}$ and 1 inch taps can also be used on-



THE HUBBELL BALL BEARING TAPPING MACHINE.

a large variety of work. Ball bearings, as thrust collars, lessening the friction, enable the machine to perform its work with one-third less power. The spindle is driven with two 3-inch belts and runs at a speed of from 400 to 600 revolutions per minute, according to the size of the tap and nature of the work. The machine is fitted with a trip that reverses the tap automatically after reaching any given depth, thereby saving time and breakage of taps. It is built in three different sizes.

The Wabash Bridge & Iron Company, Wabash, Ind., are completing a large steel bridge for Richmond, Ind., where it will be put across the Whitewater River, for the Cincinnati, Richmond & Muncie Railroad. The bridge is 688 feet in length. The spans run from 40 to 100 feet, the two 100-foot girders being 12 feet high and weighing 150,000 pounds each. These girders have just been shipped from the works, and each girder required three flat cars for its transportation. When completed, the bridge will be $\frac{3}{4}$ feet above high water, 42 feet below low water; width, 10 feet; spread of masonry in piers, 12 feet, each 5 feet above high water. The bridge contains 1,250,000 pounds of steel, and its cost will exceed \$100,000.

At Pittsburgh, the Gabel Mfg. Company have filed a bill in equity against the Ruud Mfg. Company, alleging infringement of an improvement in water heaters.

Light Lathes and Screw Machines.*

BY JOHN ASHFORD.

Many changes have taken place during the last few years in the methods of machining in our various engineering establishments and manufactories, changes which are necessary in the march of progress, and which we must and do recognize as essential in order that we, as a country, may maintain our position in the manufacturing world.

That the matter is serious is evident from the fact that in certain manufactories whole shops have been cleared of their machines and a completely new and up to date plant installed. This paper has, therefore, been prepared in order to create an opportunity for the discussion of the details of machine tools upon which much thought has been bestowed. It is intended that the term "light lathe" as applied in this paper shall indicate lathes such as engineers use, the centers being below 10 inches. The ordinary lathe, with which we were satisfied ten years ago, does not fulfill the requirements of the present day. There is no disputing the fact that it was a good, serviceable tool, but the necessities of these times demand a machine which may be more smartly worked, be more handy and cause less loss of time. What, then, are the requirements of a present day lathe for tool and ordinary work, and how may these be fulfilled? In answer to the first part of this question, the author puts forward his views with all deference and desires that members will state theirs, and, in answer to the second portion, by way of solution, he ventures to point to certain existing designs.

Let it be granted as a first principle that the machine should be stiffly constructed, and so lined up and fitted that initially it may do satisfactory work; then:

a. Its wearing parts should be made of such material and so shaped, proportioned and protected that its wear may be reduced to a minimum and the accuracy of the machine be maintained, and that such wear as takes place may be compensated for by adjustments.

b. The various changes of speed, of traverse, of tool position, of tail stock position, &c., should be effected by handle movements, which should be practically instantaneous in action and within easy reach of the operator. The use of a spanner for either of these purposes is undesirable.

c. A reasonable change of speed should be possible without the handling of belts.

d. All ordinary speeds of traverse should be obtainable without the removal and changing of spur wheels or belts.

e. When screw cutting or chasing from the lead screw one movement should suffice to release the screw and withdraw the tool from the work.

f. When taper turning it should not be necessary to disturb the alignment of the tail stock or the set of the rest.

g. Feed stops should be introduced and also means of reversing the feed traverse.

h. It should not be possible for any two speeds of traverse to be in action at one time.

It is difficult to exactly specify the requirements of a turret lathe, as so much depends upon the nature of the work to be machined. It may, however, be conceded that many of the requirements set forth in paragraphs *a* to *h* apply with equal force to turret lathes, and in addition the following:

i. When working from the bar a self centering chuck must be fitted that shall have sufficient power and range of action to securely grip the bar when subjected to its heaviest cut, and allow for ordinary variations in the diameter of rough stock while taking its grip without moving the stock longitudinally.

j. There should be a suitable means of feeding forward the stock when required, without undue loss of time, and it should come into action immediately the chuck is released.

k. The design of the revolving tool holder or turret should be such as would allow the greatest range of

action; hold a sufficient number of tools for all ordinary work; support the tool without spring with the heaviest cuts; bring the tools into action, accurately located; simplify the construction and setting of tools and their holders, and revolve and locate itself automatically.

l. Independent stops should be provided for each tool, and when the turret traverse is actuated by power the stops should throw out the power mechanism.

m. The means of traversing the turret should be such as to allow of quick movements while changing the tool positions and steady motions while cutting.

n. A cross slide is usually desirable to carry forming,

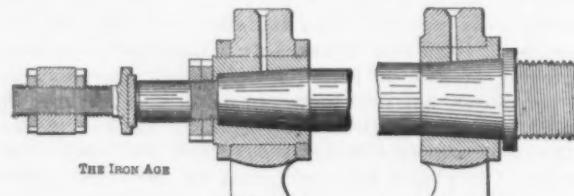


Fig. 1.

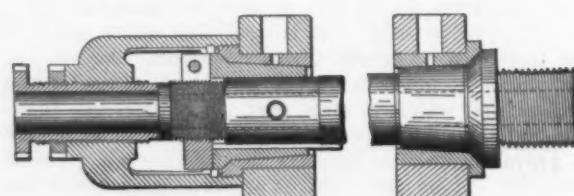


Fig. 2.

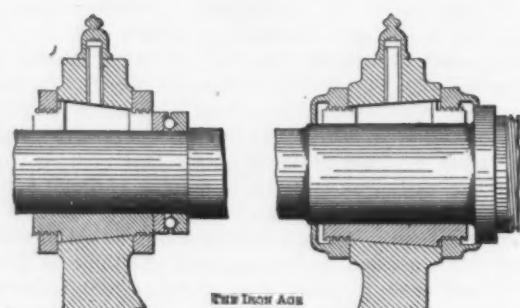


Fig. 3.

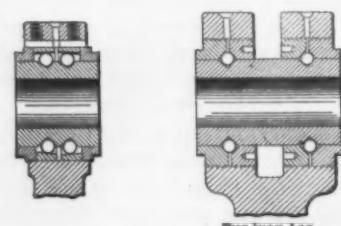


Fig. 4.

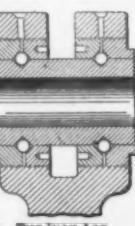


Fig. 5.

Spindle Bearings.

cutting off and chasing tools, and its position should be easily and accurately adjustable.

o. In many cases, especially for brass work, efficient means of chasing should be introduced, and if for this purpose a leader screw is used excessive wear of the screw should be guarded against.

Full automatic screw machines, suitable for automatic turning in addition to screw making, may be considered to be modified turret lathes, with mechanism added to automatically regulate the various movements. The requirements of the turret lathe thus apply also largely to this class of machine, and in addition the following:

p. The head stock should retain some of the features as in the turret lathe, with modifications adapting it to automatic working. The speed of spindle rotation should be variable to a limited extent; but the intro-

* Paper read before the British Institution of Mechanical Engineers.

duction of self opening dies has rendered it unnecessary to provide any reversing mechanism.

g. A cam shaft must be introduced to regulate the movements of the various parts, and, as the speeds of the movements are required to vary, the cam shaft speed should be changeable, this speed variation being quite independent of the spindle speed.

r. It is a debatable question as to whether the turret carrying the tools should have a constant or a variable distance of forward traverse. The settlement of this point greatly affects the design of the machine, and, in

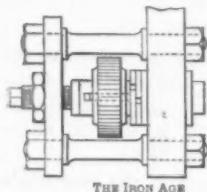


Fig. 6.

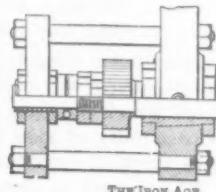


Fig. 7.

the author's opinion, the correct answer to the question is that unless the scope of the machine is to be very much restricted the forward traverse should be variable.

s. The mechanism controlling the tool movements should provide for a rapid withdrawal of the tool and change of position, so that idle time may be reduced to a minimum.

The question now is: How may the requirements of the foregoing paragraphs best be fulfilled, and to what extent do they affect the construction of the machines?

Respecting paragraph *a*, the wearing parts which affect the accuracy of the machine are: The journals and bearings of the spindle, the various slides and slide surfaces, the screws and their nuts. That a wearing

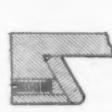


Fig. 8.

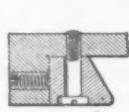


Fig. 9.



Fig. 10.



Fig. 11.

Adjusting Gibs.

surface may act satisfactorily it is recognized that the following conditions should be fulfilled: 1. That any pressure brought to bear upon it should be evenly distributed. 2. That it should be protected from dirt of every description. 3. That it should be efficiently lubricated. 4. That the surface itself should be sufficiently large. 5. And, finally, its formation should not admit of any pressure brought to bear upon it being mechanically increased to any serious extent.

Light Lathes.

The Spindle.—It is a point for debate as to whether the spindle should be hard or soft. In the opinion of the author it is of much more importance that the bearing

sirable, but if they are of ample proportions it becomes unnecessary. Too soft a metal, on the other hand, is not satisfactory, as it does not last well enough. Both phosphor bronze and cast iron may be considered suitable—that is, if the bearings are well bedded and of sufficient diameter and length to satisfy condition 4, respecting wearing surfaces. Several different forms of spindle bearings are shown in Figs. 1 to 5. The conical construction, as in Figs. 1 and 2, has the rather serious objection of failing to comply with condition 5, re wearing surfaces, for should the thrust bearing be improperly adjusted, the cone will be forced more deeply into its bearing, thus increasing the pressure on the surface, thereby creating excessive friction. The cone bearing, in fact, does not lend itself to either of the conditions 4 or 5, as, with a reasonable taper, the bearing is short; but if, on the other hand, the length is increased, there is a finer taper, which still further violates condition 5. The author prefers the design shown in Fig. 3, where the bearing surfaces are parallel and the exterior of the bearings is coned. The bearing is split in one place and eased in two others, thus making a springy bush which, when adjusted longitudinally, will close upon

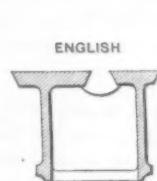


Fig. 15.

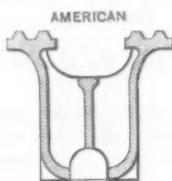


Fig. 16.



Fig. 17.

Lathe Bed Sections.

the journal. This retains the advantage of the cone adjustment with a parallel bearing. In this same bearing conditions 2 and 8 are well satisfied, there being a felt oiling pad introduced into the split of the bush and dust caps over the ends of the bearings. Halved bearings are very largely used, and ball bearings, as in Figs. 4 and 5, have been tried.

Thrusts.—With the cone bearing an adjustable end thrust, such as in Figs. 6 and 7, is necessary; but when parallel bearings are used a non-adjustable ball thrust is satisfactory, and it may be placed inside the poppets, thus adding to the compactness of the head stock.

Adjusting or Gib Strips.—Several different arrangements of these strips are illustrated in Figs. 8, 9, 10 and 11. Those in Figs. 10 and 11 should undoubtedly be used

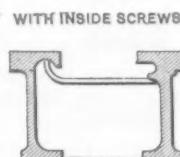


Fig. 18.



Fig. 19.



Fig. 20.

Bed Sections.

where possible, and the strip should have sufficient metal in it that only two adjusting screws may be necessary. It cannot be considered good practice to use thin strips with three or more grub screws for adjustment.

Slide Surfaces.—That slide surfaces may wear well the conditions as to wearing surfaces should be met as fully as possible. When the force applied for the purpose of traversing a slide is not central with the resistance a couple results, with a tendency to twist the slide. A very small angle of twist causes condition 1 to be violated, consequently, unless the strips are so adjusted that there is no slack, the condition cannot be satisfactorily complied with. This logically leads to the following conclusions: 1, Either the screw or other means of traversing the slides must be in line with the resistance; or, 2, where that is impossible, as it usually is, and as an ordinary machine operator cannot be depended upon



Fig. 12.



Fig. 13.

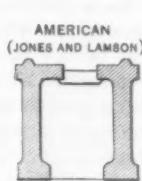


Fig. 14.

Lathe Bed Sections.

surface should be large and that the journals be made truly cylindrical.

The Bearings.—As materials, each of the following is found to have been used: Hard steel, cast iron, phosphor bronze and brass or cast iron lined with white metal. When the bearings are small no doubt hard steel is de-

to keep the strips correctly adjusted, the adjustments must be automatic; or, 3, the guide surfaces in contact should be very long. From these points of view it is evident that the nearer a traverse screw is to the center of the slide ways the better. The usual practice with the slide rest conforms to this, but not so with the saddle, although some firms put the lead screw in the interior of the lathe bed.

Now, as regards the shape of the slide ways of the bed, how do the above conclusions affect their form? As it is impossible to apply the traversing force to the

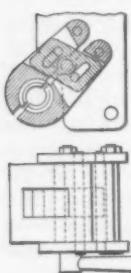


Fig. 21.

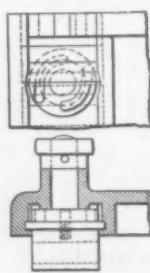


Fig. 22.

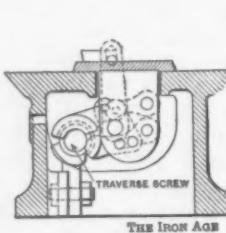
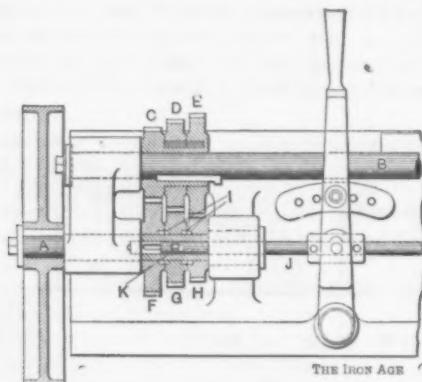


Fig. 23.

Release Nut Clutches.

saddle in line with the resistance, and as it is not desirable to make the guide surfaces so long as would be required by the third conclusion, the second should be considered more closely. That the saddle may have no tendency to twist under the action of the traversing force, this conclusion requires that the guide surfaces shall automatically adjust themselves to each other. On inspecting, then, the various bed sections illustrated in Figs. 12 to 20 to see if either is of a form that will provide this automatic adjustment, it will be found that those having raised V's undoubtedly do so, for gravity acts as a closing force, keeping the surfaces in contact.

Considering the remaining conditions, 2, 3, 4 and 5, as affecting bed sections, condition 2 requires protection from dirt. A shape which affords the least facility for catching dirt, or more especially metal particles which would work in between the rubbing surfaces, causing rapid wear, is one having a sloping surface, such as those in Figs. 13, 14 and 16. The possibility of satisfying

Fig. 24.—*Change Feed Motion (Lang).*

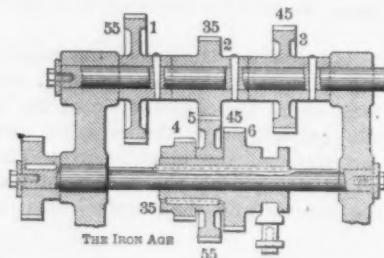
condition 3 follows on a fulfillment of 4, provided that there are ample means for the continuous application of oil, which is rarely the case.

English lathe builders pride themselves upon the ample surface supporting the saddle as obtained by the shape in Fig. 12, which is lost by the use of raised V's. No doubt such a form has the very decided advantage of giving direct support to the saddle and reducing spring to a minimum. The great disadvantage of the raised V form, as in Figs. 13 and 16, is the lack of support for the saddle immediately under the tool rest. The saddle fits upon the two outer V's and thus has a long span, so tending to make it weak in the back and lacking in stiffness. If, however, the inner V's are placed at a lower level, it allows of an increased thickness in the saddle, which tends to minimize this disadvantage. Moreover, if

the cross slide way is raised upon the saddle, instead of sunk into it, the slide which fits upon it may be of greater length, thus giving a better distribution of the pressure from the tool when cutting, so adding to the stiffness. Such an arrangement has the further advantage of protecting the cross slide way from metal cuttings. Ample support for the saddle is desirable, but broad, flat slide surfaces on the bed are not unmixed blessings, for they easily catch the metal cuttings, which work under the saddle and form the chief factor in the wear of those parts. All things being considered, the author is of opinion that the requirements of paragraph a are more nearly met by a bed plate with raised V's, the inner pair being set lower than has hitherto been the practice.

Release Nut Clutch.—The accuracy of the machine for screw cutting will be affected by the construction of the clutch which operates the release nut. There should be no possibility of side flexure. Figs. 21, 22 and 23 show three ways of constructing this clutch.

With regard to paragraph b, it is one of the essentials in modern factories that a cutting tool shall be made to work at as high a speed and with as heavy a cut as can mutually be worked together, which usually means frequent changes of speed to suit different diameters and variations in cut. The average workman is not, as a rule, particularly keen to get the utmost from his machine, and the greater the trouble to change the speed the less often he will do it. It therefore follows that

Fig. 25.—*Change Feed Motion (Archdale).*

the more easily and quickly a change may be effected the more likely is the machine to approach its maximum output. This points to the wisdom of making a machine handy, as per the requirements of paragraph b. How then may these quick variations of speed referred to be obtained? First, in the drive from the main to the countershaft, by using several sets of pulleys of differing diameters, or by friction cone drives, or expanding pulleys; secondly, with ordinary stepped cones in the drive to the lathe; and thirdly, with back gearing. Friction cone drives have been put forward more of late. Messrs. Ward are making a facing lathe which has a chain connection from the cross traverse screw to the striking fork, so that as the screw is rotated to traverse the slide rest a motion is transmitted to the striking fork by the chain. The relative motions are so arranged that, when the cutting tool is advanced toward the lathe center, the striking fork is moved to give a greater speed to the lathe spindle, thus maintaining a constant cutting speed.

Back gearing, as originally fitted, was rather troublesome to put into and out of gear, necessitating the stoppage of the machine and the use of the spanner. The introduction of friction back gearing is an improvement which greatly facilitates the change of speed, and is undoubtedly a valuable feature in the modern machine, which might with advantage be more generally introduced. With a head stock thus fitted practically an instantaneous change over of the back gearing may be made, and for this purpose friction clutches are introduced into the interior of the belt cone and the large gear on the spindle.

Changes of Traverse.—A further requirement of paragraph b—namely, that the changes of traverse should be effected by a handle movement practically instantaneous in action—is most important, both for ordinary turning and for screw cutting. An examination of the following methods now in use will be of interest. The change feed motion largely adopted for the purpose of driving the

traverse shaft and lead screws is shown in Fig. 2, it being part of an open spindle capstan lathe. A short driving spindle A is mounted parallel to the traverse shaft B, and three pairs of wheels, C F, D G and E H, mesh together upon the shaft and spindle. The wheels upon the spindle each have six keyways, and are also counterbored, as shown in drawing at I. The spindle is bored and slotted to receive a rod, J, armed with a cross piece, which acts as a sliding key, K. The handle, situated in front of the gantry, is used to slide the rod with the key K, its position determining which of the

that it serves both as a screw and a traverse shaft. It will be interesting to learn the opinions of members on the use of the lead screw in this dual capacity. Change wheels are used in the usual manner, the intermediate wheels being mounted upon a quadrant; but the number is very limited, as there are only two with 36 teeth, one with 140, and one with 69 teeth, though the latter, however, is used but rarely. The gear is well known. It consists of 12 wheels all keyed to a spindle, and a tumbler or socket wheel constantly in gear with a wheel on the lead screw, which can be slid along to engage with any one of the 12 wheels.

Figs. 27, 28 and 29 show modifications of the Hendey-Norton gear, combined with a second change as in the Ward gear, but obtained in a different way. It will be seen that below the head stock and within the bed plate there are two shafts, the upper one A the tumbler shaft, and the lower one B the change gear shaft. Upon the portion of the lower one and within the bed plate there is arranged a series of change wheels, and into either of these the intermediate gears carried in the sliding tumbler may be caused to mesh as required. The second series of changes is in the wheel train, between the gear shaft B and the lead screw C. The arrangement consists of a pair of gear wheels keyed upon the shaft B at D, and their teeth are in the ratio of 1 to 2. A quadrant, E, pivoted about the shaft B, carries a spindle, and upon

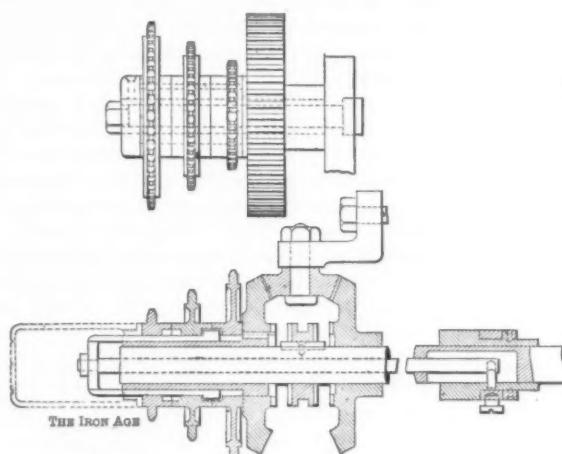


Fig. 26.—Feed Change Motion.

pairs of wheels shall be operative. The centers of the shaft and spindle are 3 21-32 inches apart, and the wheels are paired as follows:

First pair..... C 3/4 inch pitch diameter, 39 teeth.
F 4 1/16 inch pitch diameter, 49 teeth.
Second pair..... D 4 1/4 inch pitch diameter, 48 teeth.
G 3 5/16 inch pitch diameter, 49 teeth.
Third pair..... E 4 1/2 inch pitch diameter, 54 teeth.
H 2 15/16 inch pitch diameter, 34 teeth.
The pitch is 12 diametrical, and the feeds are one-thirty-second, one-twenty-fourth and one-sixteenth respectively.

In the arrangement, Fig. 30, for a similar purpose there is also a driving spindle and traverse shaft. There are three pairs of wheels, but they are not continually in gear. The action is obvious. The pitch of all the wheels is 10.

The feed change gear in Fig. 26 is a modification of that shown in Fig. 24. The drive in this case is by roller

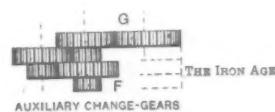


Fig. 27.

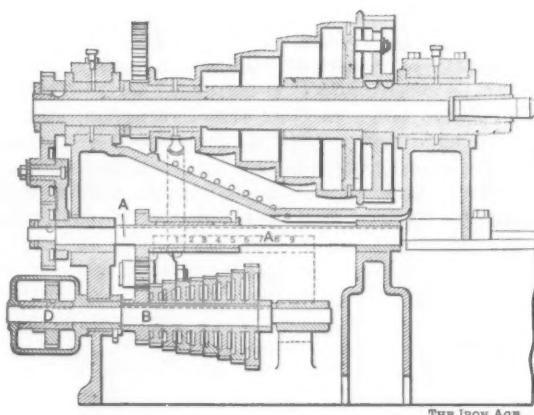


Fig. 28.

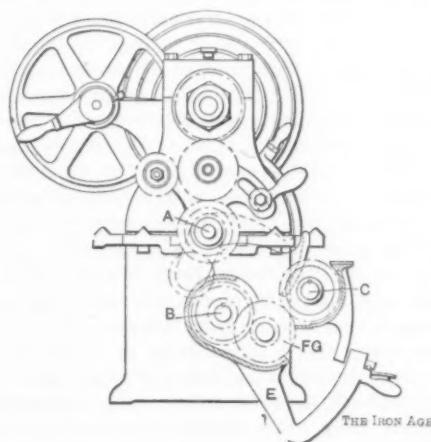


Fig. 29.—Head Stock Section, Showing Change Gear.

chains, with three pairs of sprocket wheels. The driven wheels are mounted upon a sleeve, which rides upon the end of the traverse screw, and sliding keys are provided within the driven wheels.

The change wheel system, usually known by the name of the Hendey-Norton gear, is a very handy arrangement, and has been much copied. This gear serves to regulate the traverse for both screw cutting, turning and facing. That it may apply for the several purposes the lead screw is cut with a keyway along its length, so

it two twin gears, F, G, are free to rotate, which twin gears are similar to each other, each consisting of two attached gears in the ratio of 1 to 2. When in position the smallest spur wheel at D meshes with the larger part of one of the other twin gear, and the largest spur wheel at D meshes with the smaller part of the other twin gear; thus their relative speeds of rotation are as 1 to 4. The final closure of this train is a sliding wheel upon the end of the lead screw, which it is possible, by a handle movement, to slide into either of four positions meshing with any of the wheels forming the two twin gears, and the wheels are actually meshed by raising the quadrant. By this device four different speeds may be given to the lead screw for each position of the tumbler on shaft A. The lead screw on this lathe has a keyway along its length, so that it may act as a traverse shaft, as in the Hendey-Norton lathe, the gear in the apron increasing the cuts per inch to the threads obtained from the screw in the ratio of 2.5 to 1.

Another requirement of paragraph b is that the tool position should be readily changeable; therefore the question we have next to consider is, what movements of the tool are necessary, and how may they be obtained? That the cutting tool may be brought to an exact position three directions of motion are essential. 1, in a horizontal plane in the direction of the lathe axis; 2, in a

horizontal plane at right angles to the lathe axis; 3, in a vertical direction.

As a rule, provision is made for ready adjustment in the first two directions by such means as the compound slide rest; but for the third adjustment we are rather too familiar with the use of metal packing strips varying in thickness. What is wanted is a quick vertical adjustment obtainable without loose pieces of any description, for which purpose several firms use elevating cross slide ways, but in most of these arrangements stiffness and rigidity are sacrificed.

A further consideration of the movements of the tool

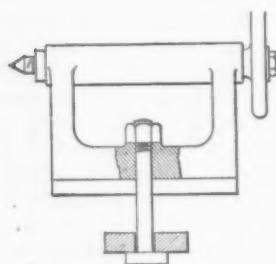


Fig. 30.

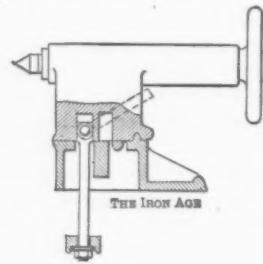


Fig. 31.

Fixing of Loose Head Stock.

In the horizontal plane, both parallel to and across the line of axis of the lathe, opens up a number of points for discussion, such as the relative merits of the ordinary English saddle with its compound slide rest, and of the apron saddle now being so largely fitted both in America and here. As regards the English saddle, the longitudinal hand traverse is effected by a rack and pinion motion without intermediate gear, and movement so obtained is very jerky and unsuitable for feeding the tool in its cut. Consequently it is only used for shifting the saddle position when the tool is not in action, and the compound slide rest is used for hand feed or for fine adjustment of the tool. As regards the apron saddle, the vertical front plate or apron has gearing within it for obtaining the various motions in an easy manner. For

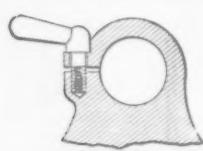


Fig. 32.

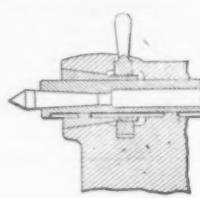


Fig. 33.

Back Center Locks.

instance, there is gearing between the hand wheel and the rack and pinion, which gives enough mechanical advantage to enable the operator to give an easy and steady hand traverse to the saddle with fine adjustments, thus rendering unnecessary the compound slide rest. These are too well known to need illustration.

The abolition of the compound rest necessitates other modifications in the machine, such as cutting away the saddle to clear both the fast and loose head stocks, that the tool may get home to the centers. Further, as the fiddle slide of the compound rest is not available to set to an angle for turning tapers, other means must be provided if such work is to be done. The apron type of saddle has been modified to specially suit the turret saddle and cross slide of the larger types of turret lathes, where automatic traverse is essential.

On many machines the loose head stock is constructed in two parts, and provision is made to set over the top portion to throw the center out of line and so obtain the taper required. In the author's opinion such a method as this is bad, as, in a machine where accuracy is essential, such accuracy being dependent upon the setting of centers and slides, disturbance should not be permitted when it has once been tested and proved accurate. The only remaining methods of obtaining the taper are, then, either to provide a means of compounding the longitudinal and cross traverses by gearing in any desired ratio, or to use an adjustable former. The first of these two methods is used in a few designs, but it is too complicated; so the latter seems to be the better solution of this problem.

As to the final requirement of paragraph *b*, of the methods of fixing illustrated in Figs. 30 and 31, the former, although most largely used, requires the objectionable loose spanner, whereas the latter, operated by a handle and eccentric movement, may be considered more satisfactory.

Figs. 32, 33 and 34 show three methods of locking the center slide, and of these the last tends, when locking, to

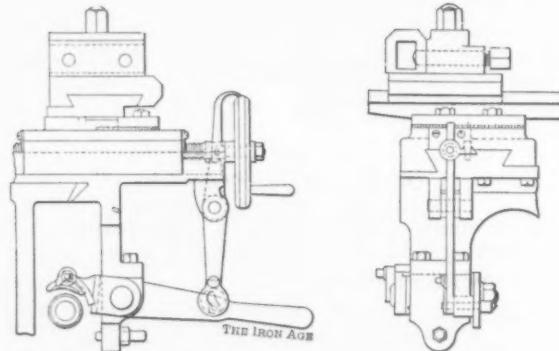


Fig. 35.—Turret Lathes

keep the slide in position, whereas the others are likely to spring it out of place.

Regarding paragraph *e*, several devices have been introduced for obtaining the double action with one motion.

Turret Lathes.

In the earlier days of engineering large quantities of similarly turned articles were not, as now, required; therefore, the type of machine evolved at that time was one that could be used for a variety of work, and the chief object sought was general adaptability. When the need arose for the production of many similar articles at low cost, manufacturers, adapting the machine to their requirements, fitted stops to the slides, so that unskilled labor might successfully do the work of turning; but to produce a complete article this often meant a number of chuckings. This system of working may still be found in some factories. As a further improvement on such a method the turret form of tool holder was introduced, and that developed into the type of turret lathe with which we are now familiar. It will thus be seen that the modern turret lathe is purely a development of the turning lathe, brought about by the necessities of modern manufacturing. The requirements of this type of lathe have already been set forth in paragraphs *i* to *o*, and will now be further considered.

Chucks for Turret Lathes.—There seems to be some difficulty in designing a chuck which shall comply with all the requirements of paragraph *i*, especially when the bar to be operated upon is over 1 inch in diameter. The usual thing is some form of collet chuck, as Fig. 36, together with which is combined a device for obtaining a mechanical advantage and securing a tight grip. The most favored method of operating collet chucks is by the combination of a pair of bell cranks with a sliding cone. The Wolseley, Herbert, Cleveland, Hartners and Brochie systems were illustrated. Other methods are by a system of wedges, by modification of the toggle joint, and by different screws. The combination of wedges is well

exemplified in the Pittler chuck, where there are three wedges arranged in series, together with a rack and pinion, Fig. 37.

A powerful chuck of simple form has been adopted by the Wolseley Company, in which toggle joints are introduced to get a tight grip, Fig. 38.

That applied by Ward, Fig. 39, to their larger type of turret lathes is a combination of toggles very similar to that introduced by Jones & Lamson in their flat turret lathe. The chief fault of most of the collet chucks is that the actual movement of the collet is small; and, moreover, as they must be moved to a given point to lock themselves, they allow of little variation in the size of the stock used. Consequently, as ordinary rolled stock of large sizes varies considerably in diameter, these chucks at times give trouble. The above mentioned differential screw chuck locks itself in any position, thus allowing greater variation in the size of the stock than the others, and therefore more nearly approaching the requirements of paragraph *i*.

Stock Feed.—With regard to paragraph *j*, the feeding forward of the stock quickly, yet without shock, is a matter of importance. For light stock a cord and hanging weight are satisfactory; but when a weighty bar of metal is to be fed forward the inertia of the bar is too great for such an arrangement to operate quickly yet without shock, so either a hand or power feed is necessary.

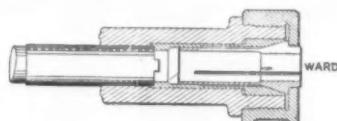


Fig. 36

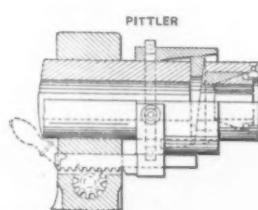


Fig. 37.

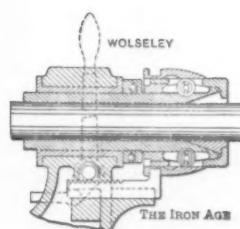


Fig. 38.

Collet Chucks.

sary. Designs of hand feed and various power feeds were shown.

Turrets.—With regard to paragraph *k*, respecting the design of turrets, the author holds the opinion that the tendency in the construction of turret lathes has been to place too narrow a limit upon the possibilities of the machines. This limit is occasioned by the type of turret and the consequent form of tools that have been necessary, the possible length of work being too short and the size of the cut too small. Here the Jones & Lamson turret lathe was described. The lead given by Jones & Lamson has been followed directly by Ward, the latter design having some important improvements, the chief of which is the feed change mechanism already described. The automatic traverse is by a lead screw that may receive 40 different speeds relative to the spindle.

The Swedish Universal Turret Lathe has the turret rotating about a horizontal axis, which is mounted upon a cross slide. With this turret there are independent stops for each tool brought into position automatically by the same movement which rotates the turret.

Inclined Turret Lathes have been designed for working upon large castings. These are new tools, in which the details of design seem to comply with all of the requirements of turret lathes excepting paragraph *o*, which does not apply to this type of machine. The work usually turned upon these machines often necessitates the use of long overhanging tools, such as boring bars, reamers, &c. The turret is therefore set over into an inclined position that these long tools may clear other parts of the machine.

Turret Traverse.—Paragraph *m* requires that provision

should be made for both quick and steady motions. For light turrets a lever or a rack and pinion motion, with capstan handles, may be satisfactory; but when getting to heavier work some other means of traversing the turret must be introduced. For this purpose worm gearing is very useful when applied to heavier types of turrets that have hand traverse, as it enables a steady motion to be given. For still heavier machines, power operated

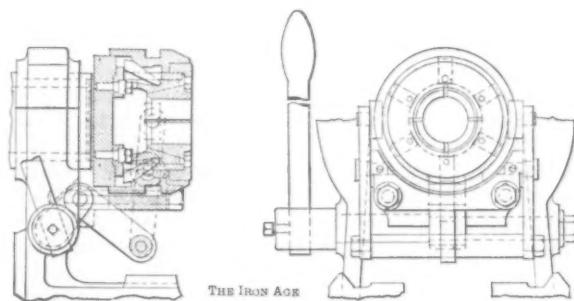


Fig. 39.—Chuck for Flat Turret Lathe (Ward).

traversing gear—such as those described—becomes a necessity, together with some form of automatic tripping mechanism. It is rarely, however, that we find a quick motion traversing gear introduced for the purpose of changing the tool positions.

Cross Slide.—With regard to the requirements of paragraph *n*, the cross slide referred to is of simple construction, suitable for the lighter types of turret lathes, in which all screwing may be done with dies, and the forming operations are simple. When, however, the cross slide is intended to act as a chasing saddle its construction must be modified and its length made greater.

Leader Screws.—Paragraph *o* refers particularly to brass working turret lathes for making such things as brass fittings, upon which much screwing has to be done. The practice in the past has largely been to provide a rocker shaft at the back, with a chasing arm, the traverse of which is derived from a short leader screw on the tail end of the spindle; but the threads so produced often vary considerably in size owing to the spring of the arm. Dies are often out of the question, on account of the weakness of the material worked; therefore it seems to be the best practice to use a chasing saddle with leader screw in a suitable position for a release not to mesh with it. By using different screws for the various pitches the wear will be distributed over a number of screws; and, moreover, the screws being short, they are not very expensive to replace when worn. This is the practice of several firms making turret lathes for this class of work.

Full Automatic Screw Machines.

Head Stock.—With regard to *p*, the stock feed, as used on turret lathes, requires some degree of modification in its adaptation to the screw machine, and it usually takes the form of a tube with a spring nose piece carrying the stock, and to which movement may be given by a cam motion. The variation in spindle speed should be such as will suit different kinds of material of all sizes within the machine capacity; but there is difficulty in getting a sufficient number of changes, consequently, as a rule, two speeds only are introduced, one suitable for turning at the larger sizes and the other for screwing with a die. It is thus evident that if the machine is put upon brass of a size smaller than its maximum the economy is doubtful. A discussion of either of the paragraphs *q*, *r*, *s* is scarcely possible without touching upon matters affecting the others.

Automatic Turrets.—These are arranged on two general systems. In one of these the turret has a definite and complete range of motion, without the possibility of variation, through which it passes for each tool place, and usually there is a special mechanism with driving gear and cam motion to operate it. In the other the turret motion is variable from nothing to its maximum, without any special operating mechanism, its movements

being derived from a cam drum placed on the same cam shaft which serves the other parts of the machine.

Each of these systems has its special advantages. The former, for instance, makes it possible to have a central thrust on the turret, which is usually mounted on a horizontal axis, and the controlling cam is easy to set. In the latter there are fewer wearing parts, and it is simple in construction, but the cams require more skillful setting to work at their best. There is, however, the further advantage that, as the turret does not require to go through its full traverse for every tool place, whether desired or not, there may be less idle time and less wear and tear.

With regard to paragraph 8, this paragraph expresses the need for rapid change of tool position during such time as the tool is not actually cutting, so that the idle time may be reduced to the shortest possible. When considering this the question naturally arises, What different speeds of tool motion are necessary? To get the most satisfactory work from automatic screw machines it is undoubtedly necessary that there should be a very quick speed for change of position; that it should be possible to change the rate of tool feed to a reasonable extent; and that the means of making the changes should be simple. Various full automatic screw machines were then described.

It will be readily acknowledged that the capstan lathe is an evolution from the ordinary lathe, and that the full automatic machine is a continuation of the same process. Moreover, the author would suggest that inasmuch as the capstan lathe developed from small to large sizes and its range of action increased by the modification of the capstan with the method of traversing it, so may the full automatic machine develop to do work of much increased size.

In conclusion, the author desires to state that it has been his effort so to build up this paper and to bring out the various points of importance in the construction of light lathes and screw machines that they may readily be grasped for discussion. He also ventures to reiterate the hope that the discussion may hinge upon the details of design, and that suggestions for improvements and future development may be put forward.

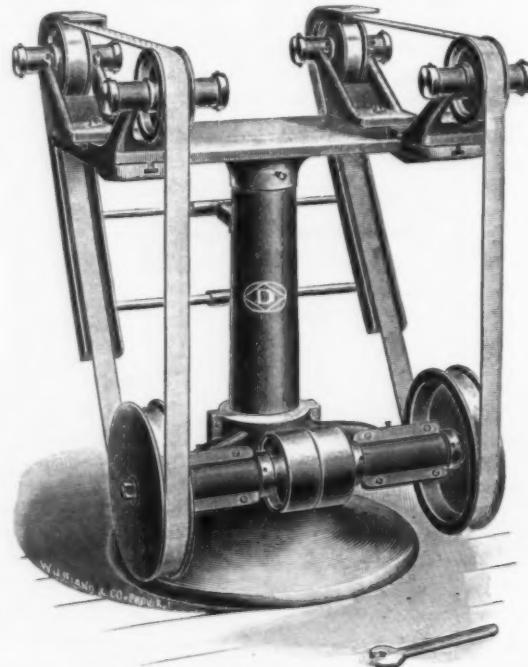
New Chicago Freight Clearing Yards.—An interesting and quite extensive piece of work is now under way in the vicinity of Chicago, which is designed to improve railroad service in that city very materially. A large tract of land has been secured west of the city, in a location now known as Stickney. It is the intention to establish here a general clearing system which will enable the railroad companies to easily make transfers of freight arriving at and departing from Chicago. All the railroads will have connection with this Stickney arrangement, and it will practically be an enormous freight yard, having 105 miles of tracks. The grading of the ground will shortly be completed, and 14 miles of sewer are in course of construction. The water distribution will comprise 11 miles of mains. Deep artesian wells are being sunk, and a power house will be erected at a cost of \$25,000. An electric lighting plant is shortly to be installed. A great deal of money is being invested in the project, and it is expected it will prove of very great benefit not only to Chicago railroad interests, but to freight shippers as well.

The Highlands Iron & Steel Company.—The Highlands Iron & Steel Company of Terre Haute, Ind., have placed contracts for their buildings and machinery. The buildings will be constructed of steel frame work, with corrugated steel siding and roofing. The roll trains and shears will be furnished by the Frank-Kneeland Machine Company of Pittsburgh, and the engines and boilers by the Bass Foundry & Machine Company of Fort Wayne, Ind. The managers of the new company hope to have the mill running in August. They will make a full line of bar iron, heavy hoops and special shapes.

The Erie Railroad will expend over \$100,000 in improvements at Sharon and Sharpsville, Pa.

The Diamond Double Belt Polishing Machine.

The polishing machine here illustrated is designed so that two operators can work upon it at the same time. The arrangement admits of using long belts, thus providing long service without change, and also having the advantage of the two guiding pulleys near together, so that less chance is afforded for the belt to slip away from irregular convex work. The driving pulleys are placed at the bottom of the stand; the pulley shafts are of steel, hardened and ground, and run in self oiling boxes. The idle pulley shafts run in bronze boxes. The idle pulley stands are clamped to the table by belts which slide in T-slots, thus permitting quick adjustment of the belts. The pulleys are 2 inches between the flanges. The bearings are protected by dust caps from emery dust and dirt, and belt guards are provided for protecting the operator and preventing injury to the belts. The main dimensions of the machine, which is built by the Diamond Machine Company of Providence, are: Height from floor to top of belt, 43 inches; size of



THE DIAMOND DOUBLE BELT POLISHING MACHINE.

small flanged pulleys, 6 x 2 inches; size of large flanged pulleys, 12 x 2 inches; size of tight and loose pulleys on countershaft, 6 x 2½ inches; distance between belt centers, 26 inches. The countershaft furnished with this machine has tight and loose pulleys 8 x 3½ inches, driving pulley 20 x 4½ inches, and should run about 550 revolutions per minute.

The Quincy Engine Company.—The new Quincy Engine Company, Quincy, Ill., have secured a site for their plant in the northeastern part of the city. The tract comprises 10 acres and will have railroad connection with the Chicago, Burlington & Quincy system. Bids for machinery will shortly be asked.

The Harlan & Hollingsworth Company, Wilmington, Del., will, on April 4, launch the large steamer, "Denver," which they are building for the New York & Texas Steamship Company. This vessel will be 400 feet long, 48 feet beam and 35 feet deep, and will be equipped with triple expansion engines, 33½, 54 and 87 inches diameter of cylinders and 54-inch stroke. Four Scotch boilers, 16 feet 3 inches by 11 feet, will furnish the steam. The "Denver" will be of 5000 tons capacity and have a speed of 16½ knots per hour. Accommodations will be provided for 500 passengers, and when completed the vessel will ply between New York and Galveston, Texas.

Canadian News.

Ontario's Ores.

TORONTO, March 30, 1901.—The annual report of the Ontario Crown Lands Department, covering the calendar year 1900, has just been issued. Under the head of "The Mineral Industry" the Commissioner makes the following remarks respecting the production of iron ore, the manufacture of pig iron and steel, and the development of new works for treating nickel-copper ore:

"The manufacture of pig iron is now firmly established, the two furnaces in operation in 1899 being supplemented by a third built by the Canada Iron Furnace Company, Limited, and situated at Midland, which was blown in in December. The demand for iron ore for home use is now large and constant, and the result is that new sources of supply are being opened up to meet it. The Helen mine, in the Michipicoten district—a deposit ranking in importance with the great mines of Michigan and Minnesota—began shipping ore to the Midland furnace during the present season, and for the first time in the history of the province a line of steamers was put in motion to supply furnaces in one part of Ontario with ore from another part, thus duplicating on our side of the international line what for years has been a familiar feature of the iron trade of the United States. Other projects for smelting furnaces are being put forward at Collingwood, Kingston, Sault Ste. Marie and elsewhere, some or all of which will no doubt arrive at fruition. At the last named place F. H. Clergue and his associates have a large Bessemer plant and rolling mills now in process of construction, and will doubtless in due time carry out that part of their programme which provides for the erection of a blast furnace or furnaces. On the Atikokan iron range several locations have been placed under option to an American company, and work is being done to finally prove the value of the properties, which has already been partially demonstrated. The likelihood is, now that the Ontario & Rainy River Railway is almost ready to haul out the ore, that ore docks at Fort William will shortly be built and shipments begun. The mines of Eastern Ontario have also been largely operated, mainly for shipment to the Hamilton smelter, but also in part for export to the United States. Men of experience in the iron trade of America entertain the opinion that in view of the extent of the ore deposits and the facilities for transportation, especially by water, Central and Eastern Ontario are at least on an equality of footing as regards the production of iron and steel with the most favorably situated districts of the United States, and that there is no presumption in looking forward to the time when Ontario will be the seat of an important and highly developed industry in the making of iron and steel. The production of iron ore for the year was 90,302 tons, valued at \$111,805, and payments out of the Iron Mining Fund at the rate of \$1 per ton of pig iron produced from Ontario ore amounted to \$12,765.82. Pig iron was made to the extent of 62,386 tons, valued at \$936,066. Open hearth steel was made for the first time in the history of the province, the Hamilton Steel & Iron Company turning out 2819 tons, having a value of \$46,380.

"The nickel and copper mines have been more active than at any previous time. The Canadian Copper Company continue to be the chief producer of nickel and copper matte, the nickel contents of which for the year amounted to 7,080,000 pounds of fine metal, worth \$756,626, and the copper contents to 6,728,000 pounds, worth \$319,681, these values being for the unrefined matte at the smelters.

"At the Victoria mines Dr. Ludwig Mond has acquired valuable nickel lands, and is erecting extensive works to produce matte carrying a high percentage of metallic contents, and a plant for retreating the Canadian Copper Company's matte is being erected by the Ontario Smelting Company at Copper Cliff, which will also smelt ores from the latter company's mine near Massey Station, now being developed. The Gertrude mine in Creighton township is being brought into producing condition by the Lake Superior Power Company, and

will supply the nickel ore to be used in the manufacture of ferro-nickel and nickel-steel at Sault Ste. Marie. Much interest attaches to the operations of the Nickel-Copper Company of Hamilton, who propose to produce refined nickel and copper by the Frasch process. In addition to these, the Bruce Copper Mines, Limited, an English company, are reopening the old workings and putting up a large concentrating plant at Bruce mines, which yielded so largely 40 years ago, and at Rock Lake the Rock Lake Mining Company are pushing developments upon a copper vein of unusual promise, and are likewise erecting works to treat the ore. The total quantity of nickel and copper ores raised in the province during the year was 221,695 tons."

Shipbuilding Project at St. John.

The promoters who have been negotiating with the City Council of St. John, N. B., for establishing yards to build steel ships laid a statement before the Council some days ago, the statement being put in by Harvey Harding. Its main points are the following:

"With regard to the subsidy that it will be necessary for the city to offer and the conditions of such offer, it will be necessary for the city of St. John to appropriate a cash subsidy of \$200,000 as follows:

"One hundred thousand dollars to be offered as a bonus for the establishing of a steel shipbuilding yard, with capacity for 25,000 tons per year, to be paid upon the completion of the yard.

"One hundred thousand dollars to be offered as a bonus for the establishment of an engine and machine shop, necessary to manufacture machinery for the amount of tonnage mentioned, to be paid upon the completion of said shops.

"If the city of St. John will offer the subsidy described and the New Brunswick Government will offer a subsidy for the same purpose equal to that of the Nova Scotia Government, and our engineers approve one of the suggested sites of the city, we think that our associates will be willing to co-operate with us in undertaking to establish, maintain and operate a steel shipbuilding plant in St. John."

The committees dealing with the question ordered a by-law to be prepared to provide as follows:

"1. That the city may give a site or assist the company to obtain a site, the value of land or cash or both together not to exceed \$100,000; nothing to be given except a site until the works are completed.

"2. To give not exceeding \$100,000 to provide for construction of machinery.

"3. Assistance for site or machinery may be given upon two-thirds vote either by direct grant of cash or by annual subsidy or subsidies, upon such terms and conditions as may be agreed upon between the city and the company.

"4. Power to the city to appropriate for a site.

"5. Power to exempt from all taxes except school and water rates for 20 years."

Mr. Harding was in Montreal recently, and with him another St. John man, J. H. Thomson of the shipbuilding firm William Thomson & Co. They said that provisional directors had already been appointed to the new company and that the capital stock would be \$3,000,000. Mr. Thomson calculated that if a plant were installed in Canada five steamers could be put out, the first of them in about six months and a half.

Dartmouth Wants to Build Steel Ships.

A joint committee of the Board of Trade and City Council of Dartmouth, N. S., has submitted the following report to the latter body:

"The committee appointed by your Council and Board of Trade to consider the proposal to offer the assistance of the town to any company establishing a steel shipbuilding plant in Dartmouth, beg to recommend to your Council the advisability of procuring at the present session of the Legislature authority for the town to borrow a sum not exceeding \$100,000 for the purpose of inducing the establishment in Dartmouth or vicinity of a steel shipbuilding plant and the construction of steel ships; the said sum to be applied in the manner and with

such restrictions as may be arranged between the town and any company establishing such plant."

The report was adopted by the Council and a committee was appointed to act with the Recorder and representatives of the Board of Trade in drafting a bill on the lines of the report.

A New Foundry for Toronto.

Arrangements have been completed for the building in the northern part of Toronto of large foundry works. They will be occupied by the Canada Foundry Company, at present engaged in manufacturing on Front street in the premises long used by the St. Lawrence Foundry Company. The Canada Foundry Company are now one of the constituent concerns of the Canadian General Electric Company. They were purchased by the Canadian General Electric Company a short time before the latter acquired the manufacturing property of the Royal Electric Company of Montreal. A site of 30 acres has been secured in North Toronto, at a point near the intersection of the Canadian Pacific Railroad and Northern Railway lines. Here will be erected foundry works of a capacity that is exceptionally large for this country and of the most modern equipment. For the past month the company's architect, accompanied by a man who has a practical knowledge of the needs of a large working plant, has been looking over works in the United States—at Buffalo, Cleveland, Erie, Chicago, Bethlehem, &c.—acquiring information as to the latest and best methods of shop construction, the newest and most economical machine tools and appliances, and equipments generally. When a report based on these studies has been prepared and adopted the plans will be completed in accordance with it, and the contract will be let as soon as possible. Building is expected to start within the next three months and continue for about a year. Besides a large general foundry, there will be a foundry for the manufacture of gas pipe, water pipes, hydrants, valves and water works supplies of all kinds. Other buildings will be machine shops, structural iron shops, blacksmith shop, pattern shop, power house, storehouse, stables and offices. Railway tracks are to be run through each shop and electric cranes will be provided for handling work up to 50 tons. All the machinery will be operated by electric motors from current generated in the company's power house. Hitherto the Peterborough and Montreal works of the Canadian General Electric Company engaged in the manufacture of electrical machinery and apparatus have been dependent for their castings upon various sources of supply. The new foundry works are primarily for the purpose of furnishing these castings, and, secondarily, to carry on a general engineering and manufacturing business. Recently the main works of the Canadian General Electric Company, at Peterborough, were enlarged. These and the newly acquired works of the Royal Electric Company at Montreal will keep one department of the new foundry busy turning out castings.

MINOR NOTES.

Dissatisfaction in machinery manufacturing circles is felt with the tariff change placing beet sugar making machinery on the free list. A meeting of the Legislation Committee of the Canadian Manufacturers' Association was called at the instance of leading companies concerned, to take action on the matter. It was decided that the Government should have left the duty on, except in the case of sugar machinery not made in Canada. It is expected that a deputation will be sent to make representations to the Government in support of that view. In the past, however, the making of a duty conditional upon the fact that the article is manufactured in Canada has not worked well. There was the utmost difficulty in carrying out the item of the tariff referring to mining machinery on account of the presence in it of that condition. It was afterward removed and the bulk of the machinery that makes up a mining plant is now free.

The Ottawa Car Company have closed a contract with the Imperial Government for 300 transport wagons such as are used in the South African war. They are negotiating now for a second order from the Government.

A new corundum company, with an authorized capital of \$1,000,000 and with their head office in Toronto, have just been incorporated. They are called the Imperial Corundum Company and the following are provisional directors: L. A. Morrison, James Curry of Toronto; Rev. Phillip S. Merrill, Buffalo; Geo. A. Sanborn, Kenmore, N. Y.; A. J. Hathaway, North Tonawanda, N. Y.

Wm. A. Rogers, Limited, Toronto, has been incorporated with a capital stock of \$1,350,000, to manufacture cutlery, silver plated ware, &c. James S. Lovell, Wm. Bain and Robert Gowans, Toronto, are provisional directors. An issue of the company's stock was at once taken up by the public.

Letters patent have been applied for to incorporate the John Bertram & Sons Company of Dundas, for the purpose of manufacturing machine tools, machinery, pulp and paper machinery, &c. The proposed capital is \$300,000 and the applicants are John, Alexander, Henry and Thomas Bertram.

A carload of pig iron has been shipped from the Dominion Iron & Steel Company's furnace to the Montreal Pipe Company, Three Rivers; the Truro Foundry & Machine Company, Truro, N. S., and the Sylvester Mfg. Company, Lindsay, Ont.

C. A. C. J.

A Crane Service for a Shipbuilding Plant.

The Fore River Ship & Engine Company, Quincy, Mass., have lately taken the contract for two battleships for the United States Navy, and are thoroughly preparing themselves for the work which they have undertaken. They are getting together an equipment, which for speed, good workmanship and economical handling of materials will be in the front rank among the shipbuilding concerns of the world. Among their new work lately ordered they have just contracted with the Wellman-Seaver Engineering Company of Cleveland, Ohio, for a crane service over their shipbuilding berths. This construction will be of steel throughout, and will consist of a frame work which will carry two pairs of runways over each ship, on which will be operated electric traveling cranes, of about 5-ton capacity, so that instead of following the usual practice in most of the shipyards in this country of having one cantilever gantry serving two ships while under construction, each berth will have two electric cranes, for use during the whole time of the construction of the ship. These cranes will be designed for very high speeds, so that the work of putting the material in place during the building of the ship will be performed with the greatest possible saving of time. They have also contracted with the company for a fitting out crane of an entirely novel design. This will be an electric traveling gantry or fitting out crane, with a folding jib, which can be moved along the wharf to its place alongside of the ship, the jib lowered to its place, the machinery or other material taken out of or put into the ship as may be desired. This crane will have two trolleys, one of 50 tons capacity and one of 25 tons. There will also be a lifting tackle of 10 tons capacity attached to the end of the jib, which may be used for putting masts or the smoke stacks into the ship. It is believed that this tool will prove to be one of the most useful tools in their yard.

The new \$1,000,000 dry dock of the Newport News Shipbuilding & Dry Dock Company, at Newport News, Va., is rapidly approaching completion. The dock is of the following dimensions: Length on top, 837 feet; length inside caisson, 806 feet; breadth on top, 162 feet; on the bottom, 80 feet. It will be capable of receiving the largest vessel ever constructed or designed with plenty of room to spare, and two of the largest battleships can be docked at one time.

The W. D. Deckert Company, Dubuque, Iowa, have incorporated, with a capital stock of \$30,000, to deal in pumps, pipes, pipe fittings, mill supplies, etc. The officers are: I. Clemenson, president; W. D. Deckert, secretary and treasurer.

Belgium's Iron and Steel Production.

BRUSSELS, February 28, 1901.—The Belgian metallurgical statistics for the year 1900 have been issued, and a comparison with former years may therefore possess a good deal of interest.

Pig Iron.

The production of pig iron in Belgium during the last ten years has been as follows in metric tons:

The Pig Iron Production of Belgium.

	Tons.	Tons.
1891	684,126	1896
1892	753,268	1897
1893	745,264	1898
1894	818,597	1899
1895	829,234	1900

The year 1900, therefore, in comparison with 1899, indicates a slight falling off. During the second half of 1900 production has amounted to 523,787 tons, as compared with 494,720 tons during the first half year, a fact rather unexpected, since the metallurgical crisis commenced to develop toward the beginning of the second half. In 1899 the production was 533,900 tons during the second half, as compared with 490,676 tons during the first six months of that year. Therefore the situation was quite parallel to that of 1900, which is natural since industrial prosperity was growing during the latter part of the year.

According to character of iron the production during the last two years was as follows:

	1899.	1900.	Difference,
	Tons.	Tons.	Tons.
Mill iron	317,029	306,439	- 10,590
Pig iron for steel purposes	623,382	623,608	+ 226
Foundry iron	84,165	88,460	+ 4,295
Totals	1,024,576	1,018,507	- 6,069

The only falling off, therefore, has been in the case of mill iron, the production of which has declined 10,590 tons.

The following table shows the imports and exports and the apparent home consumption for the years 1898, 1899 and 1900:

	1900.	1899.	1898.
	Tons.	Tons.	Tons.
Production	1,018,507	1,024,576	979,755
Imports	305,628	359,720	317,828
Totals	1,324,135	1,384,296	1,297,583
Exports	8,282	13,501	16,789

Apparent home consumption 1,315,853 1,370,795 1,280,794

The Belgian consumption has therefore fallen off in 1900 as compared with 1899 to the extent of 54,942 tons.

The Production of Finished Iron.

The following table shows the production of finished iron during the last ten years and indicates very clearly how this branch has fallen off. As will be noted further on, steel does not seem to have taken its place:

	1891.	1892.	1893.	1894.	1895.
	Tons.	Tons.	Tons.	Tons.	Tons.
Production	497,380	479,008	485,021	453,290	445,899
Imports	1,018,507	1,024,576	1,024,576	1,024,576	1,024,576
Totals	1,515,687	1,502,584	1,509,597	1,477,866	1,470,475
Exports	8,282	13,501	16,789	16,789	16,789

This table shows that the production in 1900 was lower than it was in any one of the preceding years, and it is particularly during the second half that this decline took place. The production during the first half of the year has been 197,730 tons, while that of the second half was 164,522 tons.

Steel.—Intermediate Products.

The following table shows the production of intermediate products, steel, this covering blooms, billets, &c.:

	1891.	1892.	1893.	1894.	1895.
	Tons.	Tons.	Tons.	Tons.	Tons.
Production	243,913	263,037	273,113	405,661	454,619
Imports	1896	1897	1898	1899	1900
Totals	598,974	616,541	653,523	731,249	654,827

While the production grew steadily from 1891 to 1899, it dropped in 1900. During the second half of that year the output was only 292,057 tons, as compared with 362,770 tons for the first half of the year. In 1899 the re-

sults were 360,490 for the first half and 370,750 tons for the second half.

Finished Steel.

In finished products the output during the last ten years was as follows:

Production of Finished Steel.		
	Tons.	Tons.
1891	206,305	1896
1892	208,281	1897
1893	224,922	1898
1894	341,318	1899
1895	367,947	1900

These returns show that in finished steel the development was not more favorable than it was with the intermediate products. On the contrary, the product for 1900 was even less than that of 1898.

Summarizing the figures for both finished iron and finished steel, we have the following table covering the last ten years:

Total Production of Finished Iron and Steel.			
	Finished iron.	Finished steel.	Total production.
1891	497,380	206,305	703,685
1892	479,008	208,281	687,289
1893	485,021	224,922	709,943
1894	453,290	341,318	794,608
1895	445,899	367,947	813,846
1896	494,032	519,311	1,013,343
1897	474,819	527,617	1,002,436
1898	485,040	567,728	1,052,768
1899	475,198	633,950	1,109,148
1900	362,252	564,056	926,308

This shows a decline in finished iron and steel during 1900 of 182,840 tons as compared with 1899. This table indicates that in Belgium the substitution of steel for iron has been slower than in other countries, but that in spite of this the disappearance of iron finished products is only a question of a few years.

Home Consumption.

The following table shows for the last three years the production of finished iron and steel, imports and exports, thus indicating the apparent home consumption:

	1900.	1899.	1898.
	Tons.	Tons.	Tons.
Production	926,308	1,109,148	1,052,768
Imports	89,226	78,087	62,725
Totals	1,015,534	1,187,185	1,115,493
Exports	511,900	625,734	649,978

Apparent home consumption 503,625 561,451 465,515

This table shows that not alone the exports have been unsatisfactory in 1900, but that also, though to a lesser degree, home consumption has fallen off as compared with 1899. It will be noted that from year to year the imports have slightly increased, an abnormal situation for a country which, like Belgium, depends essentially upon exporting its products.

The figures are alarming for the metallurgical industry of Belgium. It is manifestly placed in an inferior position as compared with its foreign competitors. This is chiefly due to the fact that the greater part of the ores, to the extent of 90 per cent., must be drawn from foreign countries, and that often having long distances to travel, with high freights, their cost is excessive when laid down at the furnaces. Formerly the metallurgical industry of Belgium found some compensation in the excellent character and the relatively low cost of its labor, but the workman has greatly increased his demands and has shown less industry since the organization of the socialistic party.

The following table shows the source of the ores used in Belgium:

Importations of Foreign Ores.			
	1900.	1899.	1898.
	Tons.	Tons.	Tons.
Luxemburg	1,324,572	1,412,438	1,223,282
Spain	267,547	292,580	287,740
France	246,156	211,994	159,121
Germany	116,077	107,224	83,163
Sweden	87,053	62,604	33,836
Portugal	40,630	49,894	46,278
Greece	21,770	43,268	17,663
Algiers	162	2,740	14,717
Other countries	37,152	26,156	12,398
Totals	2,141,128	2,208,898	1,878,198

It will be observed that the most important source of ore is the great Duchy of Luxemburg, the distance for the Liege district being about 163 km. and for the Charleroi district 190 km.

Lake Iron Ore Matters.

DULUTH, MINN., March 31, 1901.—The demand for ore properties, developed mines, has not been so urgent as now. The big concerns are anxious to increase their reserves and the little ones see they must have ore mines or go out of business. Both parties are busy and many options have been taken expiring between now and May 1. Negotiations are entered upon for the sale of the great property of the Cleveland Cliffs on the Marquette range, and it is possible they may be carried through, though Mr. Mather is very proud of his company and has never intended to let a control go. Still money is an inducement, and the several millions said to be offered for the mines looks very large. The sale of Aragon, expected for two weeks, has been made to the United States Steel Corporation. Samuel Mather had an option and turned it over to the combination. The Aragon is a splendid property, and if it was bought for less than \$3,000,000, as report says it was, the buyers have a satisfactory deal. On this basis one can guess what Cleveland Cliffs would bring. It is two and one-half times the producer, has much more undeveloped ore land, its own railways and vast hard wood acreage. Options are out on several of the most important independent Gogebic properties, and the list of independent miners is being steadily reduced.

There is, naturally, a good deal of exploration. New drills are starting in number. While most of this work is on the Mesaba range, there is much on the Marquette, especially around Negaunee, which has been noted already, and there is some on the Menominee. On the Mesaba three contractors are working 38 drills and the private concerns doing their own work have many more. Drilling has just started close to Hibbing, on land that was tested unsatisfactorily last year, but where ore is still supposed to exist. The exploring on the Atikokan range for the steel and wire interest is about over, and the option expires in two weeks. It is not announced what disposition will be made of the property.

The Ownership of the Gogebic Range.

The present ownership of the entire Gogebic range is as follows, the list being of especial importance now when there is so much call for ore and so much disposal of property: Beginning at the extreme west of the range, in Wisconsin, going easterly: The Iron Belt is owned by Oglebay, Norton & Co. and the Rands, making it a Rockefeller interest; the Atlantic is a Steel & Wire property; the Montreal belongs to Oglebay, Norton & Co.; the Carey and Superior group now is Pickands, Mather & Co.'s. Here intervenes the Montreal River, the State boundary. On the Michigan side the Ashland, which comes first, is owned by the Hayes Bros. of Ashland; the Norrie, East Norrie, Aurora and Pabst by the Oliver Iron Mining Company; the Newport by Ferdinand Schlesinger; the Puritan, Ironton and Federal developments by Corrigan, McKinney & Co.; the Jackpot by Jones & Laughlins; the old Colby is abandoned by Corrigan, McKinney & Co.; the Tilden belongs to the Oliver Company; the Palms to Schlesinger; the Mikado to Pickands, Mather & Co.; the Chicago exploration to the Oliver Company; the Pike to Captain Pike of Bayfield; the Brotherton and Sunday Lake to Jos. Sellwood, and some lands further to the east to Corrigan, McKinney & Co. This is everything on that range of any present moment.

Draining Lakes.

There is renewed talk of the probability of draining the various lakes around Ishpeming and Negaunee. The success that attended similar work at Lake Angeline and the probability of ore under Teal Lake, at Negaunee, as well as under lakes Sally and Iron Mountain, at Ishpeming, has started it. It is quite probable that some steps in this direction may be taken later, though there is nothing definite at present. It is certain that

Teal Lake will be drained if indications are borne out after explorations there. This lake will be the largest that has yet been attempted in the lake region, covering many acres and containing many billion gallons. These three lakes are the source of supply for the two cities near them.

The Larson explorations near Negaunee have been secured by Geo. Maas and will be tested once more. It is possible that ore may be found, though the ground has been gone over quite fully in time past. Still Mr. Larson has lately found some ore there.

The Cleveland Cliffs Company have made another large purchase of hard wood lands, being 24,000 acres in Alger, Luce and Schoolcraft counties.

The Hathaway Graphite Mining Company, at L'Anse, have a large amount of excellent graphite mined and are crushing and grinding it for various purposes. With the lower grades they have a graphite paint, that is said to be excellent.

The Hilltop, at Crystal Falls, has resumed, and will mine steadily. The Pittsburg & Lake Angeline Company are exploring the Monongahela. The manganese mine opened last fall on the tip of Keewenaw point is being abandoned, as the ore has petered out. It was originally a copper mine.

The Ore Properties of the United States Steel Company.

The Iron Age figured nearly two months ago that the ore interests of the great consolidation were, on the basis of last year's production, 10,465,000 gross tons a year. In this list the three-fourths interest of the Oliver Company in the production of the Lake Superior Iron Company, Marquette range, was not included in the totals. National Steel's one-quarter interest in Biwabik was 230,000 tons, both of which additions made the combination's ore on last year's basis amount to 11,228,000 tons.

Since then the combination have secured Aragon, 400,000 tons, and are figuring on other properties of importance. Through the Steel Hoop they have one-half Union, which will add 75,000 tons this year. They will open the Stevens, perhaps 50,000 tons, this year. Their new Hartford, Marquette range, should win 40,000 tons this year. Their Lac Fumee, Menominee range, is sinking a shaft and will be a good producer shortly. The Stevens, Hartford and Lac Fumee come through the Oliver Company. Other explorations are being opened, but can scarcely be producers this year. Through the Steel & Wire they may have the Atikokan ores, which can produce this year if desired. Through the Minnesota Iron Company the Corsica is being developed for a moderate output this year. Through the Steel & Wire Company the Chisholm is being opened and the Clark, adjoining, is being made a far larger producer than last year. The same is true of the Sauntry and also of the newer Vermillion range properties at Ely, through the Oliver Company.

But until the present options are either taken or left, it is impossible to tell what the combination's probable production for the year may be.

D. E. W.

Kidd Bros. & Burgher Steel Wire Company.—The above named concern, whose plant is located at McKee's Rocks, Pittsburgh, are running full time and have a very large amount of work on hand. The concern are makers of Kidd polished drill rods, polished pinion wire, polished needle wire, high grade steel wires and black steel rods. Their business has grown rapidly recently and the firm are considering the question of building a large addition to their plant. They have just closed a contract with the Waltham Watch Company of Waltham, Mass., for their entire year's supply of watch wire, which is of particularly fine quality. The concern also sell fine watch wires to other watch companies and have a very large trade in this specialty.

The Farrel Foundry & Machine Company, Ansonia, Conn., have just made a 40-ton casting for the public pumping station of Philadelphia. This is the heaviest casting the company have ever made, and it is believed the heaviest ever turned out in New England.

Industrial Betterment in a Drop Forge Plant.*

BY WILLIAM C. REDFIELD, TREASURER J. H. WILLIAMS & CO., BROOKLYN.

I excuse my presence here, representing a concern that is but a pygmy among giants, by supposing your committee thought well to have some one speak for a specialized line of manufacture, to state what is done toward industrial betterment under our peculiar conditions. As it is often stated that specialization injures workingmen, a word from us may not be amiss.

We confine ourselves to one line and to a limited portion of that line; we employ special apparatus as far as we may, and shall never be, therefore, large employers of labor. The duty none the less, and, we think, the privilege, of industrial improvement lies on us as on others. What little we have tried is not worth mentioning among the greater achievements you will hear of to-night; we would rather speak modestly about it, suggesting merely that what one employer can do another cannot, that what is wise in one place may be elsewhere unwise, yet that every employer in his own way and to a greater or less degree can do something toward industrial betterment and therefore for his own final profit.

Protection to Workmen.

We have, of course, a mutual aid society, run by the men, which provides weekly payments for the sick, and immediate cash payments in case of death, and in addition has a physician, under salary, who attends sick members and provides medicines without further charge. None of our men who are members of this society (and all may be members) need pay doctor's bills, medicine bills, or go without income in time of sickness. Furthermore, should any employee leave us who has been a member of the mutual aid a year without receiving sick benefit, he is refunded one-half of all his payments thereto.

In addition to basins and sprays in each room, we have four bathrooms, with showers and hot and cold water, and also a tank with wringer for washing clothes and a warm room for drying them. Our practice is to place a separate bathroom in each department, as conditions permit.

In our shops many workmen own their own tools. These we insure against loss by fire or water, without charge, the consideration being service in the works fire department.

We have offered prizes for suggestions for improving methods, open to any one not on salary—that is, foremen and office clerks were excluded. The prizes for suggestions received during a given six months were \$50, \$25, \$15 and \$10 respectively. These were awarded by a committee of the foremen, including such officials as the chief engineer, not directly interested in the producing departments.

Our men give annually to the local hospitals, and it is our custom to add an amount equal to that contributed by them, making for years the largest contribution from any factory in Brooklyn to hospital work.

Protection against fire being of great importance to us and the working force, we have spent some thousands of dollars on fire preventive, restrictive and extinguishing appliances. Our fire brigade has repeatedly, on drill, closed every door and window in the works, covering two squares, manned 17 hose lines and numerous lesser apparatus and had four pumps ready with full service steam and water pressure in a minute and a half, and has then restored the apparatus to place and had the works running again in good order in five minutes from the time an unexpected alarm was given. Our water supply is independent of the city—from wells.

In every practicable way we protect machinery, by guards and otherwise, against accidents, and invite suggestions from our force as to accident prevention, giving them assurance that such suggestions are welcome and in every possible case will be carried out.

* An address delivered before the Get-Together Club, New York, March 26, 1901.

Emery dust is exhausted fully from our grinding department; believing dust is detrimental to health and efficiency, the floors of our forge shops and similar departments are covered with iron plates, which promote cleanliness, both for men and machinery.

In our forge shops, besides individual chimneys for each fire and the usual facilities of ventilation by windows and by overhead fanlights, clean, fresh air is drawn in from a point high above the roof by powerful fans and distributed through each forge building until it descends over each man's head through a flexible pipe under his control, thus assuring an abundant supply of cool, pure air. In one forge are over 30 furnaces, running under forced blast, yet it is found that in hot weather, since the cooling system began, the men work steadily, output is kept up and we have not been compelled to shut down on extremely warm days, as of old. The system pays both the men and us.

All this is nothing, compared with the fact of just and fair treatment. We usually advance wages voluntarily. Have never had a general demand for advanced pay. Have never made a general reduction of pay. Those who know factory conditions will, however, think most of the fact that we have never cut piece work rates. We have not thought it just or wise to do so.

We have begun, in a modest way, illustrated lectures for our employees, of general interest and instruction, and are now installing a free circulating library for them.

We have recently, unasked, put our works on a nine-hour day with ten hours' pay, working 54 hours weekly at the wages heretofore paid for 60 hours; this has so far proved profitable; our output is, if anything, larger than before.

These things are done not as charity but as matters of justice, as privileges and as sources of profit. He who has many opportunities is in honor bound to share with those who have few. It is pleasant and profitable so to share. We shall continue along the lines suggested because we like it and because it pays to do so. It pays because a man is more than a machine. It pays because the rate of wages is not the chief factor in cost, but rather the rate of production. A clean man produces more in the long run than a dirty man. A well informed man produces more than an ignorant man. A justly treated man produces more than one who is unjustly treated. A contented man is a better and cheaper producer than a discontented man. A well paid man is a more economical producer than an ill paid man.

The Piece Work System.

If on piece work a man by skill and energy increases his pay largely we think him entitled to such increase, for we economize fuel, interest and other important items. It does not seem quite honorable, if he thus profits and we also, for us to cut away his profits, that we may gain much more; nor do we believe it pays. In our industry repairs count largely, and a well paid man will so care for machines as to minimize the need for repairs, because he loses by the time taken for such repairs; he does not waste material, for often in our processes he may waste his own valuable time when he wastes material. We find also that justly paid men save in the important item of imperfect work; our force replace in their own time work that is bad and pay for the material. Thus saving as we do in material, repairs, interest, fuel and other ways, we think justice to the workman demands that we shall not cut the piece work rate merely because he makes well thereby.

We have passed through one panic, holding our force together as a whole, without reducing pay, though our earnings for long were barely ordinary interest on our investment. We have also passed through one strike, eight years ago, in one department, caused by the mistakes of a subforeman; most of the strikers are with us to-day, and we hope will continue so.

Competitors have grown from six or so to 30 or more; nay, we compete on their own ground with European concerns. This we can do, we believe, because and not in spite of the high and continuous wages paid our working force and the superior intelligence, efficiency and good will of that working force.

No man can estimate exactly the difference in production in the same factory between a force of men justly and fairly treated, earnest and enthusiastic in their work, and a force of men who work merely because they must to get their pay Saturdays. But I believe the difference between these two may be the difference between ruin and dividends.

For the future we may say that we find the course profitable and intend to continue therein. More and more we strive for team work between ourselves and our employees. What details we shall take up I cannot say, but we wish to be assisted by a force of men as intelligent, as justly treated, as skillful and as well paid as any in our line.

Finally, gentlemen, we must not think of giving alms, but of doing justice. The American workman is self respecting, rendering fairly value for value; to offer him charity insults him. He wants and ought to be treated as a fellow man in a manly way.

Again, it is not so much what we do as the spirit in which it is done. Frills without just pay are vain; just wages and a hearty hand shake are themselves industrial betterment. Mutual respect and mutual service must come between employer and employee from real knowledge of each by the other. Let them get together.

A New Rapid Fire Gun.—F. M. Garland of New Haven, Conn., is the inventor of an automatic rapid fire gun, which, it is claimed, revolutionizes the principle upon which such arms are planned. The gun is 10 feet long, mounted on a tripod or carriage adapted for field work. It weighs only 469 pounds. The Garland gun is built on the counter record plan, and is said to be the only gun that does away with the toggle joint, the track and pinion and pendulum. Three hundred shots a minute can be fired by the weapon. The gun is of steel, mounted on a brass frame, with interrupted screw breech block and a spiral thread positive feed, a new feature in automatic ordnance. The gun, too, is constructed in such a way that its mechanism can be so thoroughly crippled at a moment's notice by one who understands it that no mechanic can repair it within a week unless familiar with it, while on the other hand it can be readjusted in a few minutes by one who knows its principle. The Navy Department is negotiating with Mr. Garland for a Government trial of the new weapon, which he has manufactured in his own machine shop in New Haven.

The Newark Iron & Steel Company.—The Newark Iron & Steel Company are building a 10-ton open hearth furnace at Newark, Ohio. The company were formerly known as the Newark Weldless Tube & Steel Company and have as their officers William E. Miller, president; J. R. Goldsboro, secretary and manager, and Samuel Morris, superintendent. It is the intention to make steel castings up to 6 and 7 tons weight, and to manufacture also what is called the "Duplex" metal, a new product, whose tensile strength, it is claimed, is greater than that of malleable iron. Since the castings can be treated in 24 hours they are expected to be higher in quality than those produced by the slow annealing process. It is claimed that this metal can be heated and worked into any desirable shape, then tempered, and thus be made as hard as tool steel.

Liquid Air as an Explosive.—The experiments made with a view to using liquid air as one of the constituents of an explosive are described by A. Larsen in a paper before the British Institution of Mining Engineers. The cartridges used for blasting trials in the Simplon tunnel consisted of a wrapper filled with a carbonaceous material, such, for instance, as a mixture of equal parts of paraffine and of charcoal, and dipped bodily in liquid air until completely soaked. The cartridges were kept in liquid air at the working face of the rock until required for use, when they were put quickly in the shot holes and detonated with a small gun cotton primer and detonator. The life of such a cartridge is, unfortunately, very short after the cartridge has been

removed from the liquid air. A cartridge 8 inches in length and 3 inches in diameter has to be fired within 15 minutes after being taken out of the liquid to avoid a miss fire. On this account the Simplon trials were discontinued; nevertheless, Mr. Larsen says that much attention is still being devoted to the matter in Germany, where investigations are being carried on in three different centers, one of them being the largest explosive works on the Continent—namely, the carbonite factory at Schlebusch.

Electrically Driven Bending Rolls

The Bullock Electric Mfg. Company of Cincinnati are furnishing large bending rolls with their motors. One of the rolls is driven by an 18 horse-power reversible, constant speed motor. For controlling the motor an automatic rheostat is used to prevent the operator from throwing on the full current too quickly and burning out the motor. The field consists of a circular yoke of special steel. While particular attention has been given to a reduction in weight, it has not been at the sacrifice of efficiency. The pole pieces, built up from soft sheet steel of the highest magnetic quality, are securely bolted to the yoke. The shape of the punchings is such as to produce a saturated pole face, and this feature, coupled with carefully proportioned windings, is largely responsible for the sparkless operation of the motor and is a feature greatly appreciated by engineers.

The field coils are machine wound and carefully insulated. The shunt and series coils of compound wound machines are separately wound. The coils are slipped over the pole before it is bolted to the yoke and, should it be necessary, are readily removed.

The armature core is built up from thin, carefully annealed sheet steel, possessing a high magnetic permeability. The disks are again annealed and then japanned. They are mounted upon the shaft and held firmly together by malleable iron end plates.

The windings, which are let into slots provided in the periphery of the armature core, are made of either copper bars or wire, as best suits the requirements. The coils are machine formed, and after being formed are thoroughly insulated with mica and other high grade insulations. They are then baked in steam heated forms while under pressure, which removes all moisture and produces a perfect and very compact coil. The result is a coil that is less liable to be injured than when produced by the ordinary method, and one which requires no further insulation when placed in position on the core. The coils of armatures are held in position by wedges of hard, thoroughly dried wood, driven into notches provided near the top of the slots.

The commutators are built from drop forged bars of pure lake copper, with selected mica insulation. They possess great durability and have an exceptionally even wearing surface for the brushes.

The brush holder is simple and highly efficient, giving absolutely no trouble. It is of the reaction type; no adjustment of the brushes is necessary, and when they are once set the motor will operate in either direction without sparking and under all variations of load.

Cahall Boilers in China.—The Aultman & Taylor Machinery Company, Mansfield, Ohio, builders of Cahall vertical and horizontal water tube boilers, have just made through their sales agent in New York a sale of some boilers to go to Shanghai, China. In 1898 this firm sold through their representative in Yokohama, Japan, a boiler to the Municipal Councils, Shanghai, China, which boiler was installed in their water works plant, and the sale above referred to was the direct result of the successful installation of the boiler sold in 1898. In other words, this is the second sale of Cahall boilers made to these same people, and both made in the face of very strong opposition from the English and other foreign manufacturers. The Aultman & Taylor Machinery Company are at this time installing a large plant of Cahall boilers for the electric lighting plant in the city of Manila, Philippine Islands, and shipped last week boilers to Korea and Yokohama, Japan.

The Iron Age

New York, Thursday, April 4, 1901.

DAVID WILLIAMS COMPANY,	PUBLISHERS.
CHARLES KIRCHHOFF,	EDITOR.
GEO. W. COPE,	ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS,	HARDWARE EDITOR.
JOHN S. KING,	BUSINESS MANAGER.

The Fifth Edition of "The Iron Age Index Supplement."

Accompanying this issue of *The Iron Age* our subscribers will receive a copy of "The Iron Age Index Supplement." It contains the full index of the reading matter to Volume 66 of *The Iron Age*, specially prepared by an expert, and a very full index of the goods manufactured by the regular advertisers in *The Iron Age*.

State Both Sides.

In *The Iron Age* of March 7 we reproduced an article on an English wheel lathe from the *Engineer* of London. This was an effusive commendation of an English machine which had displaced one of American design and construction, representative of its type. The article presumed to describe a sort of test between "a remarkably fine tool" of English make and a boring mill of "the highest class of American workmanship and design." The statement is made that the former had the best of the contest when all things were considered, as the workmanship was of a higher quality and the time occupied in doing the work was less. With the latter it was found that while it would do the rough, heavy cutting it could not take a fine finishing cut, as "it was found that the table of the machine shook to such an extent that it was impossible to effect good workmanship." The reason why the tool was capable of heavy turning and yet failed on light work our contemporary does not attempt to explain.

Some interesting statements are made when the merits of lathes of this character and boring and turning mills are compared. Concerning the placing of work in the machine it is stated that it is not true that this can be done more readily on the mill than on the lathe. In the case of large mills the workman has "to get right onto the plate to adjust the clamps, &c., or when boring to gauge the hole." It must be a wonderful hardship and exceedingly wearisome for the English mechanic to step on a platform 12 or 18 inches above the floor. While the makers of the boring mill were known to the *Engineer*, this machine was not illustrated "for obvious reasons"—reasons obvious only to the editor of that paper. The entire report is conspicuous for its evident bias, for omission of facts, for gross ignorance as far as one machine is concerned and for the total absence of that spirit of fair play which has been the shibboleth of Englishmen for ages.

But the other side of the story is at hand. Elsewhere we publish a communication to the *Engineer* from W. S. Accles, the manager of the branch office for Great Britain of the Niles Tool Works Company. This lets in a flood of light. Complaint is most justly made that an opportunity should have been afforded the builders of the mill to tell their side of the story "before publishing a one sided and incorrect statement of the actual facts." From this letter we learn the following: The tool was sold before being taken from the works in question; the

new owner has used it without change or alteration and has ordered two more machines of the same kind. This is sufficient to prove the efficiency of the tool, both in its design and construction. This tool was purchased in preference to one similar to that employed in the trial. Again, the men were well acquainted with the lathe but were strangers to the mill, a point of no mean significance.

But we think the principal point has been overlooked, both by the *Engineer* and by Mr. Accles—namely, the deep rooted prejudice inherent in the English mind of everything from America. Once they behold the stamp, "Made in the United States," they are blinded to all good qualities and are not even willing to look through a glass darkly. To convince them of their error to their own advantage is perhaps to make an enemy of them. The most shining example of this is our friend the *Engineer*.

The Pessimistic View of Consolidations.

We differ decidedly with those who fear that the formation of great consolidations in so many industries is a serious injury to the rising generation, by depriving young men of the opportunity to engage in business. Such extreme views on this question are held by many recognized leaders of public opinion that the impression is conveyed that they believe no young man will hereafter be able by his individual efforts or ability to rise above the station in which he finds himself on starting in life. From this viewpoint the industrial situation in the United States will henceforth present simply an array of great corporations employing enormous bodies of workingmen. In other words, every man who from choice or necessity adopts a mechanical pursuit must seek employment with a large corporation, as he will otherwise have no chance to earn a livelihood. It is this belief which causes the most bitter attacks to be made on consolidations. The assumption that they will stifle or repress individual effort and thus lower the level of manhood excites greater apprehension than the fear that the influence of huge corporations may become so all powerful that they will be able to practically usurp the functions of government.

A disposition is shown to sneer at the optimism of Andrew Carnegie, who is reported to have said that if he was just at this time arriving in this country a penniless boy, as he did over 50 years ago, he would feel that fully as good opportunities were to be found now as then for improving his condition. It is admitted that one who is reported to be the richest man in the world can take a more cheerful view of life than one who is not sure of being able to earn enough from day to day to support himself and his family. It is natural that the latter should repine, feeling himself ill treated by fortune, probably deserving a much better reward for his efforts. But the man is ill advised who, himself fairly comfortable, feels called upon to preach a doctrine of despair and discouragement to others.

The future of these great corporations is not known. They will very probably have to pass through trying experiences and may encounter hostile legislation which will imperil their very existence. But if they survive after passing through such ordeals, they will not be able to monopolize the industries of this country. Those who entertain such a belief have no conception of the extent and variety of our manufacturing interests. It may with perfect truth be said that, huge as are some of the consolidations now formed, and numerous as they seem to be, they have covered but a fractional part of

the industrial development of the country. Even the colossus just formed in the steel trade by no means monopolizes that branch of business, quite a number of important establishments operating independently, as we have previously shown in these columns. Taking the iron and steel trades, however, conditions have been such for many years that men of limited capital have had difficulty in obtaining a foothold, not because of the existence of monopolies, but because the methods and processes required the investment of large sums of money. Yet notable instances have occurred of young men with no possessions but their brains and energy making themselves so valuable to the establishments with which they became connected that they have risen to be managers and part owners. Such opportunities will exist in the case of the consolidations.

But there are innumerable branches of industry in which the thrifty, capable, energetic and painstaking young man will find the way open for him to win not only a fair living but a competence. He must simply be alive to the possibilities of his trade or calling, and on the alert to grasp an opportunity when it presents itself. Furthermore, we appear to be every year developing new ideas in the industrial field, establishing new and improved methods of doing old things and adding new conveniences for the welfare or pleasure of mankind, which are steadily opening up further opportunities for the advancement of young men. Our advice to young men is not to permit themselves to be scared by the consolidation bogle man, which the pessimist is creating for their observation.

Bessemer Pig and Bessemer Steel.

The statistics of the production of Bessemer steel ingots in 1900, issued recently by the American Iron and Steel Association, when compared with the figures presented early in the year for the output of Bessemer pig reveal some differences for which it is interesting to seek an explanation. Let us place side by side the data for the last six years for ready comparison:

Year.	Production of		
	Bessemer pig. Gross tons.	Bessemer steel ingots. Gross tons.	Difference. Gross tons.
1895.....	5,623,695	4,909,128	714,567
1896.....	4,654,955	3,919,906	735,049
1897.....	5,795,584	5,475,315	320,269
1898.....	7,337,384	6,609,017	728,367
1899.....	8,202,778	7,586,354	616,424
1900.....	7,943,452	6,684,770	1,258,682

We have added a column showing the difference in tonnage, because that offers a more striking exhibit than a series of percentages would furnish.

It will be observed that there were two anomalous years, 1897 and 1900, in which the difference was cut in half and was almost doubled. On the face of it, it would seem as though in the year 1897 the Bessemer steel works drew very heavily on stocks of Bessemer pig, while in 1900 a very large quantity of pig iron of that grade was piled up. None of the reports of stocks of pig iron include the accumulations at the steel works, so that the share which these contribute to the large difference cannot be traced. It is well known that the steel works did enter the year with considerable stocks of Bessemer pig, but that they cannot have been heavy enough to account for the apparent discrepancy between the production of Bessemer pig and the output of steel ingots is proven by the heavy purchases made by the steel companies lately from merchant furnaces.

Nor would the very heavy increase in the consumption of Bessemer pig for the manufacture of malleable

castings account for it, nor would the melting of Bessemer pig for ingot molds furnish an explanation.

It looks, therefore, as though there must have been a very large increase in the production of acid open hearth steel in 1900, contrary to the general belief that the basic open hearth method has been absorbing what growth there has been during the last year. The production of basic pig iron fell off in 1900 as compared with 1899, the figures being 1,072,376 tons and 985,033 tons, respectively. The forthcoming statistics of the production of open hearth steel may throw some light on the subject.

"Higher Cost of Raw Material."

For a very considerable percentage of the iron and steel industry of this country one stock argument will lose much of its force with buyers, and that is the claim that prices for finished goods must be advanced to compensate for higher cost of raw material. To the great consolidation which controls its raw materials from the ground up the fluctuations in cost promise to be within narrow limits. It is the very fact that such is the case which is the greatest claim to supremacy which the consolidation can advance. It promises to be a fact that the workmen will have much steadier employment and therefore we may expect that wages in mining, transportation and manufacturing will be far more uniform, and generally on a somewhat higher level. While it is true that as yet buying of intermediate products in the open market may continue for some time, it is certain that ultimately this will disappear more and more. Even now it is relatively an unimportant factor. For that reason values are likely to become much less subject to those sudden jumps and drops with which the iron industry has had only too much experience. While this will be freely acknowledged, it is only reasonable that the old stock argument in favor of advancing prices, that the cost of raw materials is jumping, will lose very much of its force, and we expect to hear less of it as the "harmony of interests" yields a wider sway.

CORRESPONDENCE.

An American Boring and Turning Mill in England.

To the Editor: I take pleasure in inclosing you here-with copy of letter which I have to-day sent to the *Engineer*. You will notice it is instigated by the article which appeared in your much esteemed paper of the 7th inst.

THE NILES TOOL WORKS COMPANY,

W. S. ACCLES,

Manager Branch Office, London, Great Britain.

LONDON, S. W., March 20, 1901.

The Editor the *Engineer*, London:

Dear Sir: On opening *The Iron Age* this morning, I came across an article referring to one which appeared in your issue of February 8, at which time I was in the United States, and so did not see your article at the time it appeared.

The article in question refers to one of our boring and turning mills, which we had placed with a firm in Yorkshire. I am a little surprised, considering that your paper has business relations with us, that you should not have given us an opportunity of telling our side of the story, before publishing a one-sided and incorrect statement of the actual facts. The very fact that we had no difficulty in disposing of the tool before taking it out of the works you mention, after explaining the matter to our second client, who is using it without change or alteration, both for fly wheels and for more accurate work, and the further fact that we have had repeat orders from him for two more machines of the same kind, fully prove that there was not anything wrong with the machine, and entirely disposes of the

statement in your article that "the table shook and dithered to such an extent that it was impossible to effect good workmanship." When we originally took the order from the Yorkshire firm for our machine we were told that orders had already been placed for the special machines illustrated in your article, but that the long delayed delivery was the cause of our obtaining an order. You do not happen to state in your article that in these works they already had a lathe similar to the ones you illustrate, and to which the men were well used, and it is not improbable that this had something to do with the report made on our machine. It is a curious fact, however, that our second customer for the boring and turning mill in question purchased it in preference to a tool similar to that illustrated by you, one of which he already had in his works, and has subsequently purchased two more, which proves beyond gainsaying that there are English firms of engineers who can appreciate, and get their men to appreciate and work with good results, tools which are "of the highest class of American workmanship and design." It is needless to add that we have a very large number of our boring and turning mills at work in this country, in sizes from 30 inches to 24 feet, many of them specially used for turning fly wheels, and they have been proved, both in this country, throughout Europe, and in America, when worked by competent workmen, to give better results than any lathe that has yet been produced for this class of work.

It appears, therefore, to our mind, that the firm in Yorkshire, instead of showing up any failing in our tools, have rather shown up their own inability to get the best results from the best tools.

THE NILES TOOL WORKS COMPANY,
W. S. ACCLES,
Manager Branch Office for Great Britain.

Rolled Weldless Chain Cable.—At Lemington, on the Tyne, just beyond the Scotswood Railway Bridge, large works have been erected for rolling chain cables direct from steel bars. *Engineering* reports that the bars are heated in a furnace 70 feet long, and are drawn direct into the rolls. In the course of its passage a bar of this length, weighing nearly 2 tons, is rapidly converted into a red hot 1½-inch cable 90 feet long, link within link without weld, and with the stud already in its place in each link. The links are connected by webs and fins, which are afterward removed cold by punching and special planing machines. It is claimed that a cable made in this manner from the usual ship quality of steel is 50 per cent stronger than the best welded iron cable of the same size, and that it is also very tough. The works have a frontage to the river of 1000 yards, and are equipped with powerful machinery. The rolling mill engines have 48-inch cylinders, and drive a mill weighing over 250 tons. There are punching machines for removing the fins from the links, and a special planing machine for cutting the inner connections. The principal machines have been specially designed for this work, and patented in many countries. Rolls are now being prepared for other sizes of cables, and eventually heavy short link crane and hauling chains will be proceeded with by the Rolled Weldless Chain Company, Limited, of Newcastle-on-Tyne.

New Sheet and Tin Plate Mills.—Edward E. Erikson, consulting and contracting engineer, Garrison Building, Pittsburgh, is drawing plans for a new four-mill tin plate plant and bar mill to be built by the Carnahan Tin Plate & Sheet Company, at Canton, Ohio. Mr. Erikson is also making plans for four sheet mills, bar mills and two 20-ton open hearth furnaces to be built by the Stark Rolling Mill Company, at Canton, Ohio. It is probable the latter concern will furnish steel to the former. Mr. Erikson is drawing all the plans for both plants, including the open hearth furnaces, gas producers and all other equipment. Both mills will be built so that they can be extended at any time, and it is probable they will be made eight-mill plants in the future.

A Cuban Ore Property Sold.

The Pennsylvania Steel Company Purchased the Spanish-American Iron Company.

The Pennsylvania Steel Company have purchased the entire capital stock of the Spanish-American Iron Company and thus became the owners on April 1 of the iron mines at Daiquiri, Province of Santiago de Cuba. These iron mines have been in operation since 1895 and have been shipping at the rate of about 325,000 tons a year, although they are capable of a product nearly twice as large.

The Spanish-American Iron Company own the Lola and Magdalena groups of mines, from which their principal product comes. They also own the Providencia group of mines, which were developed last year and are now about to begin to ship, and the Berraco group and Fausto groups of mines, which during the last 12 months have been developed and which will add their product to the output in about a year. The property includes the line of railroad from the mines to the sea, about 4½ miles, the entire seaport town of Daiquiri, including its harbor and the steel loading pier extending into Daiquiri Bay. It is understood that these properties are capable of development to at least double the present shipping capacity. The purchase embraces some 20 mining claims and about 5000 acres of land.

The principal mines of the Spanish-American Iron Company are about 4 miles distant from the property of the Juragua Iron Company, in which the Pennsylvania Steel Company and Bethlehem Steel Company each own a half interest. The mines of the Juragua Iron Company have been in operation for the last 15 years. They are capable of a product of about 250,000 tons a year, but it is probable that they will be developed to greater capacity by the addition of other properties.

The Pennsylvania Steel Company are also interested in the Cuban Steel Ore Company, who have iron mines at Guama, 45 miles west of the city of Santiago de Cuba. These properties have been in process of development during the last year and a half, and the first shipments will be received by the Steel Company from this property within the next two months.

By the acquisition of the property of the Spanish-American Iron Company the Pennsylvania Steel Company come into control of all of the iron mines which are now operated in the Province of Santiago de Cuba.

The following is the average analysis of shipments made during the year 1900:

	Per cent.
Metallic Iron.....	.63.30
Metallic manganese.....	0.104
Metallic copper.....	0.149
Sulphur.....	0.092
Phosphorus.....	0.032
Alumina.....	0.885
Lime.....	0.960
Magnesia.....	0.457
Silica.....	6.420

At the annual meeting of the Spanish-American Iron Company, held in New York on April 1, the following Board of Directors was elected: Edgar C. Felton, Evans R. Dick and Francis I. Gowen of Philadelphia; F. W. Wood of Baltimore, and Charles F. Rand of New York. The officers elected were: Charles F. Rand, president and treasurer; Edgar C. Felton, vice-president; Josiah Monroe, secretary and assistant treasurer, and William C. Tegethoff, assistant secretary.

Some Rail Rolling Records.—Some extraordinary records for rolling rails are being made at Edgar Thomson Steel Works of the Carnegie Steel Company, at Bessemer, under the Kennedy-Morrison cold rolling process, which was fully described in *The Iron Age* of December 20, 1900. In March just closed there were turned out at the Edgar Thomson Works a little over 61,000 tons of finished rails by this process. On the Sunday night, March 31, turn of 12 hours, 133 heats were made in the converting mill, the output of finished steel being over 1500 tons. The Edgar Thomson Works are running on a large order of heavy rails for the Baltimore & Ohio Railroad.

OBITUARY.

ULRICH EBERHARDT.

After a lingering illness, Ulrich Eberhardt, president of Gould & Eberhardt, Incorporated, and one of the founders of the former firm of Gould & Eberhardt, died at his home in Newark, N. J., on the 31st ult. He was



ULRICH EBERHARDT.

born on December 4, 1841, in the village of Mettlen, Canton of Turgau, Switzerland. In the early fifties his father brought his family to this country, after a hard wagon passage to Havre and a 40 days' sail over the Atlantic. The boy Ulrich was immediately sent to work and received his education at the Newark evening schools. He commenced his career by stripping tobacco. He was of a mechanical turn of mind, however, and soon obtained employment operating an engine at the Ward Rule Works in Newark. Being desirous of entering a machine shop, he was apprenticed to Ezra Gould, who was then running a small machine shop at Newark. His aptitude was soon recognized by his employer, and before his term of apprenticeship had expired he was foreman of the shop. Although he held this position he was still an apprentice and received apprentices' wages, \$3.50 per week. Shortly after he had attained his majority he was taken into the firm. He immediately inspired new and aggressive methods and the concern grew rapidly. In 1890 he acquired complete control of the business and Mr. Gould retired. The firm had by this time won considerable renown as builders of high class machine tools. Mr. Eberhardt paid special attention to automatic gear cutting machinery, shapers and upright drill presses, and in these lines he made great progress, inventing many essential features of construction which won distinction for the machines. When the first boom for American machine tools came from Europe the Eberhardt machines received recognition abroad and a very large foreign business was built up by the firm. In the meantime the plant at Newark had grown to a great extent and was classed among the foremost of this country for the production of machine tools. The original shop had outgrown its usefulness and Mr. Eberhardt showed his originality a short time ago by recon-

structing the entire building, making of it a modern steel frame structure, while all of the machinery was kept in constant operation during the period of reconstruction. Mr. Eberhardt took an unusual interest in the men in his employ, and took many a young man and started him on a career of usefulness, some to occupy responsible posts in his works and others to go forth into foreign fields. His only brother, Henry E. Eberhardt, who still survives him, was associated with him in the upbuilding of the business. Many of Mr. Eberhardt's early associates are now foremen of the shop, having been connected with the works 25 years and more. Through his strong personality Mr. Eberhardt controlled his men admirably, and consequently never experienced the unpleasantness of a strike or trouble with his employees. He was a public spirited citizen and took considerable interest in local and State affairs. He was a good friend to the Newark Technical School, and, in fact, all institutions for mechanical learning. Mr. Eberhardt's sons, Fred. L. and Ulrich, who were in charge of the business during their father's illness, will continue the operation of the works.

THEODORE A. MEYSENBURG.

Theodore A. Meysenburg, founder and former president of the Tudor Iron Works and later representative of the Republic Iron & Steel Company, died at his home, 5 Westmoreland place, St. Louis, Mo., Friday, March 29. He had been ill since last November and for the past several weeks was unable to leave his room. He had planned a trip to Cuba in the interest of his health, intending to leave home about the middle of last January. At that time his condition would not permit the journey, which he postponed until he should regain strength from what he supposed was a temporary indisposition. His condition was not considered dangerous until within the



Photo by Strauss, St. Louis.

THEODORE A. MEYSENBURG

past few days. His death was due to a complication of diseases. Colonel Meysenburg was born July 23, 1840, on the River Rhine, in the Province of Cologne, and near the city of the same name. At the age of 16 years he came to America. St. Louis was made his home after arriving in this country. He first entered the City Engineer's office and was connected with that department of the city at the time the water works plant was erected at Bissell's Point. While still a young man he left the Engineer's office and attached himself to the Helmbacher

Forge & Rolling Mill Company. In 1872 he organized the East St. Louis Bolt & Iron Company. Then the Tudor Iron Works were founded, of which he was made president. This position he held until that concern were bought by the Republic Iron & Steel Company. He was then made district manager of that concern, which position he held until about a year ago, when he retired from active business. The deceased distinguished himself in the Civil War, where he won the title of colonel. He was in several battles and at Gettysburg had his horse shot under him. Soon after he was commissioned adjutant on the staff of General Howard by President Lincoln. This commission, in the great American's own handwriting, he treasured as one of his most valuable possessions. A number of relatives in St. Louis and elsewhere survive him, among them his wife, formerly Miss Lucretia Block, to whom he was married in St. Louis in 1876. He had no children. Colonel Meysenburg was one of the original promoters of the St. Louis Public Library and the Art School, and generously benefited many public institutions.

WILLIAM B. REANEY.

William B. Reaney, a well-known marine constructor and consulting engineer, died on March 27, at his residence in Philadelphia, after a short illness, from pneumonia. He was born in Philadelphia in April, 1833, his father, Thomas Reaney, being a shipbuilder and head of the firm of Reaney, Neafie, Levy & Co. William Reaney learned the business in his father's works and when 24 years of age became a member of the firm of Reaney, Son & Archibald of Chester, Pa., later the John Roach firm, and constructed several monitors for the Union Navy. When the firm dissolved Mr. Reaney entered the Columbian Iron Works & Dry Dock Company of Baltimore, and among the contracts executed were the large elevators at Girard Point, Philadelphia; those at Har-simus Cove, near New York, and the Canton elevator, Baltimore. He also acted as consulting engineer in the work of the Pennsylvania Railroad. Mr. Reaney retired from business five years ago.

ALEXANDER A. THOMSON.

Alexander Archer Thomson, senior member of the well-known tin plate and metal house of A. A. Thomson & Co., 213 Water street, New York, died on Thursday, March 21, at his residence, 28 East Thirty-third street, New York City, of heart failure, following an attack of the grip. Mr. Thomson, who was for many years a prominent figure in the New York metal trade, was born in the city 68 years ago, his parents being natives of Scotland. Early in life he entered the employ of Miller & Morrison, an old Water street firm, manufacturing and dealing in tinware and house furnishing goods. In 1858 Mr. Thomson bought out the business, and, with his elder brother, William, formed the firm of A. A. Thomson & Co., which became one of the leading houses in the metal business in New York. The firm did a large business as importers of tin plates and metals, continuing in the same location, at 213 and 215 Water street, from the beginning until now. David Thomson, another brother, joined the firm later and still continues a member of it, together with W. Archer Thomson, a son of William Thomson, one of the original partners, who died in 1872.

NOTES.

ROBERT S. ARCHER, superintendent of the Tredegar Iron Works of Richmond, Va., which was the mainstay of the Confederate Government for the manufacture of heavy ordnance during the Civil War, died in Richmond on March 30. Major Archer was well known in the iron trade of the South.

CHARLES BORROUGHS, founder of the Charles Burroughs Company, machinists, of Newark, N. J., died at his home in that city March 28 from pneumonia, aged 71 years. He was born in Trenton, N. J., and had been in business in Newark for 35 years.

DAVID B. VARNEY, for many years treasurer of the S. C. Forsaith Machine Company of Manchester, N. H., and formerly Mayor of the city, died from typhoid pneumonia March 25, after a brief illness, aged 79 years. He was a native of Tuftonborough, N. H., and early in life

entered the employ of the Amoskeag Mfg. Company of Manchester, becoming superintendent of the locomotive department. In 1857 he opened a brass foundry and coppersmithing shop under the firm name of Darling & Varney. Mr. Darling died in 1868 and since that time Mr. Varney had conducted the business alone.

EMANUEL E. KAHN, a member of the firm of Kahn Brothers, metal dealers, of 525 East Nineteenth street, New York City, died on March 29, after an operation for liver trouble, aged 50 years.

HENRY PERKINS, one of the oldest business men of Bridgewater, Mass., died March 24, at his home in that town, at the advanced age of 87 years. He was a member of a family that had long been engaged in the iron manufacturing business in Bridgewater. More than 50 years ago he established an iron foundry, which he conducted successfully for 35 years. He always took an active interest in the affairs of his town and was one of its representative citizens.

W. P. EVANS, proprietor of a rolling mill at Versailles, Ky., was found dead in his room at the Palace Hotel, Lexington, Ky., on March 24. Mr. Evans, who was 60 years old, was a native of Wales and came to this country a number of years ago.

DAVID W. HITCHCOCK, who was president of the National Tube Company of Boston before the absorption of that corporation in the combination, died in Boston, March 25, aged 70 years.

ARIO PARDEE, JR., son of the late Ario Pardee, the prominent Pennsylvania mine operator, died on March 6 in Philadelphia. He was a brother of Calvin and Frank Pardee, who are extensive operators in the Hazleton and Upper Lehigh region, and had large interests in the collieries of A. Pardee & Co., but took little active part in their management.

A. B. RICKETSON, superintendent of the ore docks of the Illinois Steel Company, at Bay View, Wis., died March 14 at Mobile, Ala., while on his way to Florida for a rest. Mr. Ricketson was born at New Bedford 54 years ago, and had been in the employ of the Illinois Steel Company for more than 25 years.

DAVID CLARK, for 39 years master mechanic of the Lehigh Valley Railroad, died at Hazleton, Pa., March 25, from pneumonia, aged 80 years. Mr. Clark was the inventor of the Clark steam brake and many other mechanical appliances.

ALEXANDER A. THOMSON, senior member of the tin plate and metal house of A. A. Thomson & Co., 243 Water street, New York, died on March 21 at his home, 28 East Thirty-third street, New York City, aged 68 years.

THOMAS F. NOONAN, Sr., who was for many years engaged in the iron and steel business in Jersey City, N. J., died on March 23, aged 73 years. He was born in Ireland and came to this country in 1848. For 50 years he had been in business in Jersey City.

WILLIAM S. PENDLEBERRY, superintendent of the Pennsylvania Engineering Works of New Castle, Pa., died March 24 at his home in that city, aged 56 years. Mr. Pendleberry was one of the best known experts in structural iron and boiler construction in the country. For several years he was superintendent for D. W. C. Carroll, the predecessor of Riter & Conley in Pittsburgh. He was also with the James Rees firm in that city.

AUGUSTUS GAYLORD died at his residence in New York, March 30, in his seventy-sixth year. He was born in Torrington, Conn., and came to New York at the age of 21 to engage in the manufacturing business. In 1856 he went to Wisconsin on account of his health, and during the Civil War became Adjutant-General of that State. He returned to New York when the war was over to engage again in the manufacturing business, retiring five years ago. He was for a term of years the commissioner of the Ammunition Manufacturers' Association.

Parties formerly connected with the Crucible Steel Company of America are organizing the Standard Crucible Steel Company, with a capital stock of \$1,500,000, to build a large plant in the Pittsburgh district.

PERSONAL.

Edward Kaden, one of the master mechanics of the Bessemer plant of the Republic Iron & Steel Company, at Youngstown, has resigned and has been made master mechanic of the new works of the Sharon Steel Hoop Company, at Sharon, Pa.

Henry C. Frick of Pittsburgh has agreed to pay the expense of improving Homestead Park, in Homestead. At the dedication of the Homestead Library three years ago, Mr. Frick promised to fill this park and otherwise improve it. It is said the improvements will cost about \$50,000.

Homer P. Goff of Goff, Horner & Co., iron and steel factors, Lewis Building, Pittsburgh, has returned from the Bermudas.

Joshua Rhodes, chairman of the board of the National Tube Company, Pittsburgh, will be elected president of the Consolidated Traction Company, in that city, succeeding C. L. Magee, deceased.

S. J. Robinson, managing director of William Jessop & Sons, Limited, of Sheffield, England, arrived in New York on Monday. Accompanied by William F. Wagner, the American representative of the company, he started for Pittsburgh yesterday to select a site for the erection of an American plant. Mr. Wagner has previously investigated several sites where the proposed works might be located and decided that the Pittsburgh district offered the best advantages. The present trip will determine definitely the exact location for the new works.

James P. Wetherow has removed from Pittsburgh and has established an office at 100 William street, New York.

Dr. C. Willard Hayes, T. Wayland Vaughan and A. C. Spencer, expert geologists attached to the United States Geological Survey, have been detailed to make a thorough geologic and mineral investigation of the island of Cuba, at the request of Governor Leonard Wood. It is expected that these geologists will secure results of distinct economic value to the island.

Capt. W. A. May of Scranton, Pa., has been appointed general manager of the Hillside Coal & Iron Company and the Pennsylvania Coal Company, with headquarters in Scranton.

B. D. Cameron of Homestead, Pa., has been appointed superintendent of the open hearth furnaces of the Sharon Steel Company, at Sharon, Pa.

W. R. Webster, consulting engineer of Philadelphia, has sailed for Europe, expecting to return early in June.

George F. Baer, long identified with the Reading Iron Company, will be the next president of the Philadelphia & Reading Railroad.

H. C. Frick has bought the St. Paul Cathedral property in Pittsburgh for about \$1,250,000.

Robert Meehan, who is interested in the new Monterey Iron Works, Monterey, Mexico, is now in this country placing orders for the equipment of the company's plant.

B. M. Jones & Co. of Boston and New York, agents of Samuel Osborn & Co., Sheffield, makers of Meshet steel, and Taylor Brothers & Co., Clarence Works, Leeds, announce that Frank E. Barnard has retired from the firm.

Richard G. Wood, one of the vice-presidents of the W. Dewees Wood Company Works of the American Sheet Steel Company, at McKeesport, Pa., has resigned his position. Alan D. Wood, his son, who is also connected with the W. Dewees Wood Company Works, has resigned his position and will retire as soon as a successor is elected to fill his place. Percifor S. Smith, who has been in charge of the Wellsville Plate & Sheet Iron Works at Wellsville, Ohio, and who is a brother-in-law of Mr. Wood, has been appointed to succeed Mr. Wood and has taken charge of the McKeesport works. The plant formerly operated by the W. Dewees Wood Company was one of the last to be taken over by the American Sheet Steel Company. The principal product was patent planished iron, which was largely used in place

of Russia imported iron, being fully equal in quality and sold at lower prices. It is used in the manufacture of cooking articles and for locomotive jackets and other purposes. The patents for the manufacture of this planished iron were largely owned by the late W. Dewees Wood, but were absorbed by the American Sheet Steel Company. The product is marketed all over the world. It is not probable a successor to the position of vice-president, formerly occupied by Mr. Wood, will be appointed by the American Sheet Steel Company, for the reason that that concern have already practically been absorbed by the United States Steel Corporation. Mr. Wood still retains his holdings in the company.

In the list of names of experts appointed by the International Association for Testing Materials are the following: John McLeod, Carnegie Steel Company; W. L. King, Jones & Laughlins, Limited, Pittsburgh, and Chas. S. Price of Johnstown. The National Tube Company have a representative, but his name has not been given in the report.

William J. Barrett of Los Angeles, Cal., has been appointed to take charge of the business of the Westinghouse Electric & Mfg. Company in Southern California.

Lee H. Bowman of the armor plate department of the Carnegie Steel Company at Homestead has sailed for St. Petersburg, Russia, to prepare designs for the armor for the Russian war ship "Varkeska," which the Carnegie Steel Company will furnish. This is Mr. Bowman's third trip to Russia, and was accompanied by Baron Michalofsky Mormohof of the Russian Navy, who spent several days in Pittsburgh last week inspecting the armor plate department at the Homestead Steel Works.

John C. Kafer, president of the Engineers' Club of New York, has returned from a trip to Cuba.

Gen. W. P. Craighill, John Fritz of Bethlehem, C. H. Haswell of New York, B. F. Isherwood of New York, Commodore Melville and W. H. Wilson of Philadelphia have been proposed as honorary members of the Engineers' Club of Philadelphia.

Edward H. Cox, who has been connected with the De La Vergne Refrigerating Machine Company of New York, has resigned, his present address being P. O. Box 1699, New York.

Daniel M. Stackhouse of Westmont, Pa., will be the superintendent of the new open hearth furnaces which the Cambria Steel Company are erecting at Franklin, Pa.

A. L. Schultz, formerly president and general manager of the Schultz Bridge & Iron Company, Pittsburgh, Pa., has been appointed to take charge of the operating department of the American Bridge Company, covering the Pittsburgh district, comprising the Keystone, Pittsburgh, Schultz and Shiffler plants at Pittsburgh; the wrought iron plant at Canton, Ohio; the new Columbus plant at Columbus, Ohio, and the Youngstown Bridge Company plant at Youngstown, Ohio.

Tom L. Johnson has been elected Mayor of Cleveland, Ohio.

E. Windsor Richards and Arthur Keen, the well-known English ironmasters, sail for a visit to this country this week.

Benjamin Talbot, the inventor of the continuous open hearth process which bears his name, is expected in this country at an early date.

Capt. Robert W. Hunt of Chicago has sailed for Europe.

J. Pierpont Morgan sailed for England on Wednesday in the "Teutonic."

John W. Gates of the American Steel & Wire Company will sail for Europe shortly.

At a meeting of the Executive Committee of the Crucible Steel Company of America, held in Pittsburgh on Monday, April 1, Reuben Miller, Sr., was elected chairman to succeed Wm. G. Park, who recently resigned. Mr. Miller also holds the position of treasurer of the company, and will resign this at an early date. The di-

rectors of the Crucible Steel Company will meet on Tuesday, April 9, to fill two vacancies in the Executive Committee, caused by the resignation of Wm. G. Park and James W. Brown, and at the same time will elect a successor to Mr. Miller, as treasurer.

Henry S. Manning of Manning, Maxwell & Moore has just returned from a trip to Cuba.

W. Bernard of the W. Toritch Company of William street has returned from an extended trip to Russia.

It is expected Sir William Van Horn, president of the Cuba Company, will return from Cuba this week.

Arthur Geisler, chief engineer of the Waterville department of the Stillwell-Bierce & Smith-Vaile Company of Dayton, Ohio, sailed last week for Jamaica, West Indies. It is reported that he is to conclude the details of an important contract for the equipment of a projected hydraulic plant.

It is expected that President Hawley of the Chaparro Sugar Company will return from Cuba in a few days.

The Bessemer & Lake Erie Railroad.

The Bessemer & Lake Erie Railroad Company, the Carnegie Steel Company road, which several months ago leased the Pittsburgh, Bessemer & Lake Erie Railroad, have taken formal charge of the property. James H. Reed has been elected president of the Bessemer & Lake Erie; James Gayley, vice-president, and R. A. Franks, secretary and treasurer. E. E. House is general manager, E. H. Utley, general freight and passenger agent, and D. E. Hum, Jr., is auditor. The Bessemer & Lake Erie Railroad Company were organized for the specific purpose of leasing the Pittsburgh, Bessemer & Lake Erie road. The members of the new company are all closely identified with the Carnegie Company. The object to be obtained in leasing the road was to bring it into closer harmony with the Carnegie interests, by whom it is now solely managed. In order to get the minority holders of the common stock of the Pittsburgh, Bessemer & Lake Erie to consent to the leasing of their road, they were guaranteed 3 per cent. dividends on the par value of their stock. Hitherto they have received no dividends. The organization of the new company and the leasing of the road were all effected before the Carnegie interests were absorbed by the United States Steel Corporation. It is stated that the transferring of the Carnegie interests into the control of the new combine was anticipated to have no other effect upon the Bessemer road than to strengthen it.

Joseph T. Ryerson & Son.—The widely known house of Joseph T. Ryerson & Son, iron and steel merchants and special agents, Chicago, was founded in 1842 and incorporated in 1888. They have had nearly 60 years of continuous existence, and are now believed to be the oldest heavy iron house in the West. Necessarily established on a moderate scale, the business steadily grew to large proportions, and for a number of years the firm have been important factors in Western trade. They formerly made a specialty of plates, boiler tubes and all boiler makers' supplies and machinery, but in addition they now operate on a large scale in light sheets, hoops, skelp, bars and many specialties. The growth of their business is strikingly shown by the fact that they have just increased their capital stock to \$1,750,000, from \$250,000. The officers of the corporation are as follows: Edward L. Ryerson, president; Hermon B. Butler, vice-president and treasurer; Clyde M. Carr, secretary.

Hill, Clarke & Co., Boston, Chicago and New York, have begun to issue a monthly magazine which they have named *Shop Talk*. It contains interesting information for machinists, engineers and users of machines, and in addition illustrates and describes the full lines of tools carried by the firm.

A movement is on foot to build a bar or sheet plant at Madison, Ill., in the St. Louis district.

MANUFACTURING.

Iron and Steel.

The American Sheet Steel Company are building another sheet mill at the Etna-Standard Works, at Bridgeport, Ohio, and are preparing foundations for three more. This will give a total of 22 sheet mills at this plant.

The National Steel Company contemplate the erection of a new bar mill in the Etna-Standard Works, at Bridgeport, Ohio, which will increase the number of mills to five.

The Crucible Steel Company of America will apply on April 15 for Pennsylvania charters for the Park Steel Company and Howe, Brown & Co. These are constituent interests of the Crucible Steel Company of America, and the statement is made that the charters are to be taken out to protect the firm names. There is also a report current that the charters are being secured in order to prevent parties who have severed connection with the Crucible Steel Company, and may possibly engage in the steel business again, from using these firm names.

We have already noted the fact in these columns that Spang, Chalfant & Co., Incorporated, of the Etna Iron & Tube Works, at Pittsburgh, would build a large addition to their plant, permitting them to make pipe up to 30 inches in diameter. The main building will be 200 x 150 feet, and will be erected by Wm. B. Scaife & Sons of Pittsburgh.

The Falcon Works of the American Sheet Steel Company, at Niles, Ohio, which have been idle for nearly a year, will be started up very soon. The plant contains four sheet mills and two sheet bar mills.

Nearly 3000 of the Reading, Pa., Iron Company's 5000 employees have received a voluntary increase in wages, some nearly 10 per cent. The increase is confined to the puddling department. Puddlers will be increased from \$3 to \$3.25 per ton. It was announced that the ruling prices of iron will not permit an increase in wages in the other departments.

The La Belle Iron Works of Wheeling, W. Va., have increased their capital stock from \$400,000 to \$2,500,000. The offices will be established at Steubenville, Ohio, where they have under way some very important improvements to existing plants, and contemplate the erection of a number of new works, plans for which have not as yet been definitely decided upon, but will be in a short time. The suit against the company for \$23,000 penalty for failure to take out a foreign corporation license has been withdrawn at the request of the Steubenville Board of Trade, who stated that the La Belle Works have not as yet made any iron in Ohio, and were only preparing to put their plant in operation.

Janson Steel & Iron Company have completed the many improvements to their mill at Oxford, N. J., and are now running night and day, turning out merchant bar iron.

The Star Works of the American Tin Plate Company in Pittsburgh, which have been idle since July of last year, will be started on Monday, April 8. It is an eight-mill plant, with a daily capacity of 1000 to 1200 boxes. With the starting of this works all the tin plate works of the American Tin Plate Company in the Pittsburgh district will be in full operation.

The American Iron & Steel Mfg. Company of Lebanon and Reading, Pa., will advance wages of puddlers from \$3 to \$3.25 per ton after April 15.

The United States Steel Company of Boston, with branch offices in the Hamilton Building, Pittsburgh, are negotiating with the Board of Trade of Butler, Pa., for the location of a steel plant to make Jupiter steel by a patent process in which a large amount of scrap is used. The company have offered to build a plant at Butler if the citizens subscribe for \$100,000 of a capital stock of \$1,000,000.

The Youngstown Iron, Sheet & Tube Company, Youngstown, Ohio, have not as yet designed a number of buildings to be erected for their plant, but are getting these in shape, and it is probable will let contracts for them within a short time.

As stated last week, H. B. A. Keiser has severed his connection with the Carnegie Steel Company, where he was for a number of years chief engineer for the Edgar Thomson Steel Works and Duquesne Steel Works, and has interested himself in the Cuyahoga Iron & Steel Company, holding the office of vice-president and secretary. This concern are erecting a rod mill with a minimum capacity of about 60 tons per day, for the purpose of supplying the E. A. Henry Wire Company with rods. The concern do not expect to have more than 10 tons per day to sell in the open market, as the Henry Wire Company are now using at least 50 tons per day.

We may state that the report that tin plate would be made by a new process in the works of the American Can Company, at Youngstown, Ohio, is untrue. There is no tin plate or terne plate being made in Youngstown at the present time, nor is there probability of a plant being started there at an early date.

The Muirkirk Furnace, Muirkirk, Md., went in blast March 23.

The Morgan Construction Company, Worcester, Mass., have been awarded the contract to place the automatic cooling beds

In the Morgan double storage merchant bar mills now being built by the Carnegie Steel Company at the Duquesne Steel Works, at Duquesne, Pa. The entire equipment of these mills was designed by the Morgan Construction Company.

Corrigan, McKinney & Co., Scottdale, Pa., expect to blow in their Charlotte Furnace about April 15, when it is believed that all repairs will be completed.

The E. A. Henry Wire Company, Cuyahoga Falls, Ohio, makers of wire and nails, are making an addition to their present plant in the shape of a galvanizing factory. They are erecting a building 215 x 35 feet, and the Bates Machine Company of Joliet are furnishing them with a complete galvanizing plant, with 20 finishing reels. They will be manufacturing galvanized wire not later than May 15, and expect to produce about 20 tons per day. Their wire mill is now turning out about 50 tons daily, of which about 15 tons are cut up into nails, the balance being sold in the form of plain annealed wire.

The Puget Sound Iron Company of San Francisco have sold their blast furnace property near Port Townsend, Wash., to the Pacific Steel Company, represented by Homer H. Swaney of McKeesport, Pa. The consideration is stated to have been \$40,000. H. A. Hall of the Wellman-Seaver Engineering Company, Cleveland, Ohio, has recently been inspecting the property, presumably to arrange for the erection of new works.

The American Rolling Mill Company, whose general offices are in the Rookery Building, Chicago, have purchased from the American Tin Plate Company the rolling mill plant at Muskegon, Mich., formerly owned by the Champion Iron & Steel Company. It is the intention of the new owners to operate the plant for the manufacture of iron and steel merchant bars. The mills will be overhauled and extensive improvements will be made. The American Rolling Mill Company are now operating a merchant bar mill at Muncie, Ind., and it is their intention to run both plants.

It is reported that capitalists of Lima, Ohio, and Muncie, Ind., are arranging to locate a rolling mill at Hartford City, Ind., to be operated under the name of the National Rolling Mill Company.

The Titusville Iron Company, Titusville, Pa., have purchased a site of land adjoining their works, and will use it for large additions to their plant.

The capital stock of the Mahoning Mfg. Company of Youngstown, Ohio, will be increased to \$200,000. The company will be reorganized and their plant considerably enlarged. They are makers of rivets, bolts and spikes.

The American Steel Hoop Company will erect four new double puddling furnaces at their Lower Union plant, Youngstown, Ohio.

The Republic Iron & Steel Company of Youngstown, Ohio, have given a contract to the Mahoning Foundry & Machine Company of that city for the erection of a 26-inch billet mill, which will be installed in the Brown-Bonnell Works, at Youngstown.

The Alcanin Tin Plate Company, Muriel Building, Pittsburgh, whose works are at Avonmore, Pa., have started work on a three-mill addition to their plant.

The Stark Rolling Mill Company, recently incorporated, have broken ground for a six-mill sheet plant which they are building at Canton, Ohio, alongside of the works of the Berger Mfg. Company. The Stark Rolling Mill Company are a separate organization but are practically controlled by the Berger Company, who will have the sale of the entire output. It is expected that the new plant will be completed and in full operation by August 1.

The Pottstown, Pa., Iron Company's steel plant is being reconstructed by the Glasgow Iron Company, lessees of the plant, to produce puddled iron by Roe's patent puddling process.

The Crum Lynne Iron Company's works at Leipserville, near Chester, Pa., were destroyed by fire March 28, entailing a loss of \$60,000, partially covered by insurance. The works manufactured charcoal boiler tube skelp and gave employment to 200 men.

The Berlin Construction Company of 220 Broadway, New York, and Berlin, Conn., have acquired control of the plant of the Pottsville Iron & Steel Company of Pottsville, Pa., and will have the bridge shop ready for operation in the near future. They are installing new tools and making other improvements around the plant, which will put it in first-class condition. The construction company report a large number of orders on hand, including among them orders from the United Gas Improvement Company, Standard Oil Company, Westinghouse Electric & Mfg. Company, Benjamin Atha, Harrison, N. J., and Russell & Erwin Mfg. Company, New Britain, Conn.

The Mahoning Mfg. Company, Youngstown, Ohio, makers of bolts, rivets and railroad spikes, are figuring on organizing a separate company to engage in somewhat similar lines to that which they are now making, but as yet their plans are not fully defined, nor are the company assured that they will go through.

A project is under way in Pittsburgh to organize a company to build a large wire mill in that city. It is stated that ample capital has been subscribed, and that the project will probably be put through.

Notices have been posted in the rolling mills of the Susquehanna Iron & Steel Company at Columbia, Pa., April 1, increasing the puddlers' wages 25 cents per ton.

The new plant of the Sharon Steel Hoop Company, Sharon, Pa., is about completed, and the first rolling will be done this week. The concern will make hoops, bands and cotton ties, and have already enough orders on their books to take their output for probably six months. Morris Bachman is president, T. Sherman Clark vice-president, and Jno. R. Hastings secretary.

The recent purchase of about 110 acres of land in Wheeling, W. Va., by Cecil A. Robinson of the American Tin Plate Company, was not made on account of that concern, but was a personal investment of Mr. Robinson's and perhaps a few of his personal friends. The American Tin Plate Company have no plans for additions to existing plants in the Pittsburgh district.

The Youngstown Iron Sheet & Tube Company, Youngstown, Ohio, have bought a site of land between Haselton and Struthers, near Youngstown, which contains 17½ acres. This land, in connection with other acreage owned by the concern, will be used for the new tube and pipe mill.

The Haselton Works of the Republic Iron & Steel Company, at Youngstown, Ohio, formerly owned by the Andrews Brothers Company, but which have not been operated since being taken over by the Republic Iron & Steel Company, will probably be started on Monday, April 8, if the plant can be gotten ready for running by that time. W. E. Taylor, general manager of the Republic Iron & Steel Company, was in Youngstown the other day and gave orders to have the mill prepared for immediate operation. The plant contains a puddling mill and three finishing mills, consisting of an 8-inch, 10-inch and 16-inch mill.

At a meeting of the creditors of the Continental Iron Company, held in Youngstown, Ohio, last week, it was decided to organize a company among the creditors and purchase the Wheatland mill, operating it under the name of the Wheatland Iron & Steel Company. The capital stock is to be \$175,000. The organization committee are sending out letters to the creditors of the Continental Iron Company, inclosing contracts and power of attorney to be signed by them, so that the committee may proceed with the organization. Together with the Wheatland plant, which includes puddling and skelp mills, the new company will take over about \$65,000 worth of raw material. The mill will start up as soon as the company are organized and some changes can be made in the plant.

Machinery.

The Youngstown Foundry & Machine Company, Youngstown, Ohio, makers of light and heavy machinery, castings, sand and chilled rolls, have received a contract for a conveyor table for the 16-inch roughing rolls at the Brown-Bonnell Works of the Republic Iron & Steel Company, at Youngstown, Ohio.

The Wheeling Mold & Foundry Company, Wheeling, W. Va., manufacturers of machinery and iron castings, sand and chilled rolls, have broken ground for their new works to be built on a site of 4 acres, just outside Wheeling, and have some of their heavy machinery under way. The main building will be of brick, with slate roof, and will be 280 x 110 feet. The cupola capacity of the foundry will be 30 tons daily and a 20-ton air furnace will be installed. The foundry and machine shop will be located in the main building, the former being 180 x 110 feet and the latter 100 x 110 feet. The foundry will be commanded by a 20-ton crane and the machine shop by a 15-ton crane. The plant will probably be ready for running in June. The output will consist of sand and chilled rolls, heavy housings and general castings for heavy machine work. The firm are now running their brass foundry at the old works.

The Lloyd Booth Company, Youngstown, Ohio, have installed in their shops a 15-ton Shaw crane. They were already equipped with a 30-ton crane.

The Union Iron Works, Decatur, Ill., are to be enlarged and the machinery equipment will be considerably increased.

Ground has been broken at Wauwatosa, near Milwaukee, for the new plant of the Edward P. Allis Company. The first buildings to be erected will be a machine shop 120 x 600 feet, and an erecting shop, 115 x 190 feet.

Charles T. Lehman, who has been in the old machinery business in Birmingham, Ala., for six years, has commenced to handle new machinery also. He has just put up a building at 1901 Powell avenue 50 x 100 feet. In the rear is a small machine shop for making repairs, the great body of the building being devoted to the keeping of stock. The office is at the Powell avenue entrance. Mr. Lehman is also about to erect a shop in which to repair his own boilers. He reports having done a prosperous trade last year, and says the outlook is very encouraging.

Some time ago the Carnegie Steel Company of Pittsburgh sent out inquiries to the large engine builders for tenders for ten large blowing engines. We may state that these engines have not been purchased, but that present engines are being repaired and will continue to be used in their stead.

Andrew P. Korstad, Terre Haute, Ind., is building an addition 35 x 150 feet to his boiler shop.

Craig Ridgway & Son, Coatesville, Pa., will build quite a large addition to their foundry, which will have all the modern

Improvements for foundry work. A new cupola will also be built to accommodate their increased business.

The Sullivan Machinery Company, Claremont, N. H., manufacturers of Sullivan core drills, channelers, gadders, coal mining machines, &c., have increased their capital from \$600,000 to \$800,000.

The Henquin Company of Schenectady, N. Y., are looking for a site for the construction of a plant for the manufacture of rotary engines. N. Henquin is president of the company.

The 350 horse-power Corliss engine to run the power plant at the Pan-American Exposition at Buffalo will be furnished by the Lane & Bodley Company of Cincinnati. The engine is of the new Twentieth Century type made by the Cincinnati concern.

The Canton Roll & Machine Company, Canton, Ohio, have added an extension to their plant 40 x 60 feet, and put in one 84 x 84 inch by 20 foot Niles planer and a new boring mill. The Canton Roll & Machine Company are makers of chilled, sand and semi-steel rolls, rolling mill and tin plate machinery, hammer dies and heavy castings of every description.

Wickes Brothers, Pittsburgh and Saginaw, Mich., dealers in second-hand machinery of all kinds, are very busy, and have recently made some large sales of various kinds of equipment. Among these may be noted 1000 horse-power boilers to the Duncannon Iron & Steel Company, at Duncannon, Pa.; two 1000 horse-power engines to the Montana Copper Mining Company of Butte, Mont.; also two 500 horse-power engines for the Atlanta Steel Hoop Company, Atlanta, Ga. To Jacob S. Coxey for the Mount Vernon Steel Casting Company, one 14 and one 18 inch mill, a part of the equipment of the Orient Steel Company of Allegheny. To the Newark Steel & Iron Company, at Newark, Ohio, Wickes Brothers have sold all of the open hearth plant of the Orient Steel Company. To Zug & Co. they sold a large engine for their plant on Thirteenth street, Pittsburgh. They have sold to the Paige Woven Wire Company of Monessen, Pa., a large engine, and to the Cambridge Rolling Mill Company, Cambridge, Ohio, a large engine of which immediate shipment was made. The Pittsburgh branch of Wickes Brothers is in charge of T. J. Brennan, and their business in that city is growing very rapidly.

The American Turret Lathe Company, Wilmington, Del., manufacturers of semi-automatic turret lathes, report numerous inquiries and orders. Among recent shipments may be mentioned one 24-inch and one 40-inch lathe for the New York Ship Building Company, Camden, N. J., and one 24-inch lathe for the Lozier Bicycle Company, Pittsburgh, N. Y., with orders for two more 20-inch lathes for the same parties. Further shipments have been made of one 24-inch lathe to the Bullock Electric Company, Cincinnati, Ohio, and to the Bement-Miles Company, Philadelphia, Pa. Orders have also been received for several 24-inch lathes for export to England, and for one 32-inch lathe for the E. P. Allis Company, Milwaukee, Wis.

The Moore & White Company, Philadelphia, Pa., are erecting a three-story brick building 40 x 80 feet, to be used as a pattern making and pattern storage department.

McDermott Bros., proprietors of the Bethlehem Boiler Works, whose plant at South Bethlehem, Pa., was recently destroyed by fire, have secured a site on the main line of the Lehigh Valley Railroad, Washington and Third streets, Allentown, Pa. The contract for the new building, 120 x 60 feet, will be awarded this week, to be followed later on by a building of like dimensions. They expect to be located in their new shops by June 1, up to which time they will be in operation at their old plant. They intend, making a specialty of boiler work, stock boxes, all kinds of sheet metal work and structural iron work.

The Helwig Mfg. Company of St. Paul, Minn., have again added additional machinery to their works in order to meet more promptly the increased demand for their pneumatic tools and their bolt and rivet clippers. They have recently placed on the market their reversible pneumatic motor, which is meeting with much favor among users of this class of tools.

The Commercial Steel Boiler Works, H. W. Markey, proprietor, have bought a lot 50 x 150 feet, adjoining their plant at Seattle, Wash., and have built a 20-foot extension to their shop. On the remaining space a platform for use in making boilers and for stock is being constructed. These improvements, with a large addition of up to date tools, such as bending rolls, punches, drills, air tools, &c., have increased the capacity of the plant many times.

The Vilter Mfg. Company, Milwaukee, Wis., have recently closed contracts for refrigerating and ice-making machinery in the States of Pennsylvania, Oregon, Missouri, Massachusetts, Kansas, Montana, Minnesota, Indiana, Wisconsin, New Jersey, Ohio and California, comprising one 250-ton, one 175-ton, two 150-ton, one 100-ton, one 75-ton, one 60-ton, three 50-ton, one 40-ton, five 25-ton, two 30-ton, five 25-ton, two 20-ton, three 15-ton, two 10-ton, one 6-ton and two 5-ton plants. They have also closed contracts for Corliss engines in Texas, Louisiana, Indiana, Wisconsin, Illinois, North Carolina and Pennsylvania, ranging in size from 10 x 30 to 24 x 42 inches, and tandem compound engines of large size.

The factory plant at Twelfth and Monmouth streets, Jersey City, N. J., formerly occupied by the New York Pottery Com-

pany, has been leased to the General Acetylene Company, manufacturers of Bournonville generators and acetylene gas apparatus. Extensive improvements will be made, which are expected to be completed by May 1.

The A. S. O'Neill Company have incorporated with a capital stock of \$20,000, of which \$17,500 have been paid in. The new company have purchased the business and plant formerly operated under the name of A. S. O'Neill, 1718-1728 San Fernando street, Los Angeles, Cal., and will continue the manufacture of all kinds of light machinery and repairing the same. The facilities are being considerably increased and the plant otherwise improved. The directors are A. S. O'Neill, C. G. Packard, who is president; T. Hendry, E. H. Hunt, Grace L. O'Neill, Cora C. Packard and F. L. Botsford.

The Wm. B. Pollock Company, Youngstown, Ohio, builders of steel plate construction of all kinds, are making shipments of material to Monterey, Mexico, to be used in building of a blast furnace at that place.

The W. W. Whitehead Company, manufacturers of boilers, Vilter Corliss engines, &c., who succeeded Jackson & Whitehead Company, have increased their capital from \$10,000 to \$100,000. A new plant is now in course of construction.

The Wm. Tod Company of Youngstown, Ohio, are building several blowing engines for a new blast furnace being erected in Monterey, Mexico. Shipment of this material will be made before long.

The Pittsburgh Shear Knife & Machine Company, whose works are in Lawrenceville, Pittsburgh, have just bought some more ground adjacent to their plant, which will be used for making extensive additions.

A certificate filed with the Secretary of State announces that the Clonbrook Steam Boiler Company of Brooklyn, N. Y., have increased the number of their trustees from four to five. Among them are Alfred E. Jones and David M. Anderson.

The Filer & Stowell Company, Milwaukee and Chicago, have closed a contract for a 2500 horse-power Corliss engine for the Detroit Railway Company of Detroit, and for an 800 horse-power engine for a firm at Mishawaka, Ind.

The Hamilton Machine Tool Company, Hamilton, Ohio, are operating their entire plant in the production of the Hamilton drills and lathes 13 hours daily, with 200 hands, the bulk of the demand being domestic. A large shipment was made recently to Glasgow, Scotland.

Foundries.

The Kerr-Murray Foundry & Machine Works, Fort Wayne, Ind., recently damaged quite seriously by fire, are to be rebuilt at once. The foundry was saved, but the machine shop, pattern shop and offices were destroyed. The loss was about \$40,000, well covered by insurance.

Edward Titcomb, L. W. Mix, L. Lindsay and William H. Hoey have incorporated the Arizona & Sonora Mfg. Company, with capital stock of \$100,000, for the purpose of doing a general foundry and machine business at Nogales, Ariz., and manufacturing wagons, carriages, &c., in the State of Sonora, Mexico. The new company will shortly be in the market for the entire equipment for their new foundry and machine shop. Ray & Titcomb, exporters and jobbers of hardware, machinery, lumber, &c., at Nogales, are the principal owners.

The Root Bros. Company, Plymouth, Ohio, are building an addition, 40 x 100 feet, to their foundry.

The Gordon Foundry & Machine Company, St. Joseph, Mo., have let the contract for a new foundry and machine shop. The building will be of corrugated iron, one story, 204 x 40 feet, and will cost about \$10,000. Machinery of the latest design will be installed, and it is expected that the plant will be in operation by June 1. Heretofore the company have confined themselves to the manufacture of the Blehien stone saw, but with the increased facilities provided by their new plant they intend doing all kinds of foundry and machine work.

Salisbury & Satterlee are building a new foundry, 40 x 110 feet, at Minneapolis, Minn., for the manufacture of iron beds.

The Fair-Day Foundry Company, Knoxville, Tenn., stoves and general founders, have changed their name to the Fair Foundry Company. A. B. Day, formerly vice-president and superintendent, has retired from the company. The officers are D. C. Richards, president; J. E. Fair, secretary, treasurer and general manager.

Martin Payton, Madison, Wis., manufacturer of gray iron castings, has put his foundry force at work on his new fuel burner, which he will shortly put on the market.

Hardware.

The H. F. Brammer Mfg. Company, Davenport, Iowa, report an excellent trade in washing machines. The demand for their O. K. machine continues to increase steadily as its merits become more appreciated, but the company are prepared through improved facilities to fill orders promptly.

The Illinois Wire Company, whose general office is in Room 1120, Monadnock Building, Chicago, have purchased the entire plant, patents and good will of the business formerly belonging to the Kilmer Wire Mfg. Company, Desplaines, Ill., and are now prepared to fill promptly all orders for the Kilmer wire goods.

consisting of stock and hog fence, lawn fence and bale ties of four distinct patterns—namely, the Arrow, the Cross-head, the Adjustable, and the Loop. They have ample capital and facilities for manufacturing these goods, and will maintain the high standard of the past.

The Fred J. Myers Mfg. Company, Hamilton, Ohio, manufacturers of hardware specialties, are very busy in all departments. As an evidence of the demand for their products a recent letter from their representatives on the Pacific Coast contained orders for upward of 21,000 flour sifters alone. A serious problem with the company at the present time, they advise us, is the procuring of the necessary help in their manufacturing department.

The plant of the American Axe & Tool Company, at Beaver Falls, Pa., will be very much enlarged.

The Chicago Hardware Mfg. Company are building an addition, 70 x 80 feet, to their factory at North Chicago, Ill.

The Ludlow-Saylor Wire Company, St. Louis, say they are booking more orders for fly screen cloth at present than have been received during any recent period. The trade appear to be of the opinion that there will be a shortage, as orders seem to indicate that dealers are providing for a heavy demand. This company are adding to their equipment of machinery from time to time, and have largely increased their output both of fly screen cloth and Perfect double crimped mining cloth.

The Cheney-Bigelow Wire Works, Springfield, Mass., manufacturers of wire cloth, Fourdriner wires, cylinder molds, &c., are building a new brick factory, 44 x 140 feet, two stories high. The cost of the building will be \$16,793, which will be largely increased by smaller contracts. Additional machines will be installed in the wire drawing department, and unusually large looms, which will include one each to weave Fourdriner wires 162, 150, 126 and 120 inches in width, will also be added. These additions will greatly increase the output of the plant and permit the employment of a large number of additional skilled workmen.

The Enterprise Mfg. Company, Philadelphia, Pa., will shortly make extensive improvements in the property, Susquehanna and American streets, which was acquired by them last fall, and which will be used as a machine shop. The first floor will be removed and the second floor replaced with one of expanded metal and concrete. A 5-ton electric crane will also be installed on the first floor.

The Brohard Company, Philadelphia, Pa., manufacturers of the Brohard door holder, &c., have recently made shipments of their door holders to Southampton, England, and Melbourne, Australia, and report a large and growing demand for their various lines of goods.

New England Bolt & Nut Company, Boston, Mass., are erecting a new factory at Everett. The main building will be a one-story brick structure, 125 x 175 feet. The other building will be of smaller dimensions and will contain the company's galvanizing plant. The buildings will cost about \$20,000. The company contemplate increasing their capital about May 1.

Miscellaneous.

Fred. T. Brosi Company, Quincy, Ill., makers of metal chain pump curbs and Never Freeze tubing, will shortly move into the factory buildings to be vacated by the Gardner Governor Company. This will give the Brosi Company much needed floor space, as the demand for their specialties is outgrowing their present capacity. New machinery has been contracted for, and in addition to making metal chain pump curbs and Never Freeze tubing they will make a full line of oil cans and galvanized buckets and tubs.

Geo. D. Hayden Machine Company, Alton, Ill., are making a specialty of propeller wheels and can furnish them in sizes from 8 to 34 inches diameter in either bronze or cast iron. The company are in position to make quick shipments.

The State Line Mfg. Company, previously known as the State Line Talc Company, Chattanooga, Tenn., are now handling a number of new lines. They are about putting on the market an argand burner for acetylene gas. They are at present being made only in the 3 and 4½ foot sizes, but can be made if required to burn any amount of gas. They are also making a burner for use on bicycles and household purposes. It is made in ¼, ½, ¾ and 1 foot flames.

The Columbia Bridge Company are removing their works from Edensburg, Pa., to East Carnegie, Pa., on the P. C. & Y. R., which is reached by the P. C. C. & St. L. Railway and P. & L. E. R. R. The company are installing the most modern machinery and will be prepared to construct 1000 tons of structural material per month. With their increased facilities they will be able to keep on hand a large stock of material and will be in a position to execute all classes of structural steel construction and to fill all orders promptly. The Pittsburgh office, after April 1, will be in the Fitzsimmons Building, Fourth avenue.

The Horne & Datz Company, St. Paul, Minn., manufacturers of tinware, are reported to have been absorbed by the National Enameling & Stamping Company. The plant employs about 300 hands.

The American Bridge Company have secured a contract for

a large amount of steel frame work for an electrical power plant to go to Ultimo, New South Wales, Australia.

The New Castle Sanitary Supply Company will build a large plant in New Castle, Pa.

The plant of the Dexter Spring & Gear Company, at Oakmont, Pa., about ten miles from Pittsburgh, which was burned more than a year ago, will be rebuilt at once. Henry Portefield, who is president of the concern, states that the new works will be larger than the old plant, and the manufacture of springs and gears will be carried on as before, except on a larger scale. The Dexter Spring & Gear Works were formerly owned by Wm. W. Greer, but passed into the hands of the present management at sheriff's sale. It is stated that two offers for the plant were recently refused by the company.

Herring-Hall-Marvin Safe Company are adding a combined boiler and engine house to their works at Hamilton, Ohio. New boilers, a large Corliss engine and a number of various machines in the shape of powerful planers, mills, &c., have also been added.

The Garry Iron & Steel Roofing Company of Cleveland, Ohio, have changed their name to the Garry Iron & Steel Company.

A. J. Haws & Sons, Johnstown, Pa., manufacturers of fire brick, have bought the plant of the M. L. Williams Brick Company at Johnstown, Pa.

The Penn Bridge Company, Beaver Falls, Pa., builders of iron and steel structures of all kinds, have been running their works nearly continuously for a year and a half, and with a very much increased output. The company have under way additions to their plant, including a new template shop 35 x 100 feet, and extensions to the main shop of 65 x 100 feet and 65 x 50 feet. Among recent orders taken are a new billet mill for the Republic Iron & Steel Company, Youngstown, Ohio; five bridges for the Sandusky & Interurban Electric Railway Company, and coal tipple for the New Central Coal Company.

The Boston Lead Mfg. Company and the Chadwick Lead Works of Boston, Mass., have consolidated. The capital stock of the new corporation is \$800,000, this stock to be paid in to the extent of \$650,000 by a conveyance to the new corporation of the manufacturing plant and real estate of the two companies, except the building of the Chadwick company, on Fort Hill Square, and balance of \$150,000 to be paid in cash.

The Pressed Steel Car Company's plant at Joliet, Ill., which was burned December 23, has been rebuilt and was put in operation last week.

The S. Obermayer Company, Cincinnati and Chicago, are remodeling their plant at Larimer, Pa. The plant is to be overhauled, new machinery installed, and the capacity materially increased.

The Westinghouse Electric & Mfg. Company of East Pittsburgh have placed contracts for the building of a large plant for the manufacture of newly patented friction draft gear. The main building will be of brick, 800 x 200. Julian Kennedy, the well-known mechanical engineer of Pittsburgh, drew the plans for the new plant.

Selberling & Miller, whose large mower and reaper plant at Doylestown, Ohio, was recently burned, will likely rebuild at that place, unless inducements offered elsewhere are sufficient to cover loss by removal, damages, &c.

The Monongahela Works of the Pittsburgh Stove & Range Company, at Monongahela City, Pa., were closed down only for one week to make certain changes. The report was printed in the daily press that the plant had been closed indefinitely, but this is not the case.

J. B. Jones & Co., Allegheny, Pa., dealers in iron and steel scrap, have installed a 55-ton shear, a large derrick and a 50 horse-power gas engine.

Geo. A. Ray Mfg. Company, who recently incorporated, have succeeded to the business and plant of the Aldrich & Ray Mfg. Company, copper and brass goods, Buffalo, N. Y. The new company will manufacture the same line of goods as the former, only on a much larger scale.

The contract for the building of the Pittsburgh Exposition, which burned recently, has been given to James Stewart & Co. of St. Louis and Pittsburgh. They have given the contract for the steel buildings to the Fort Pitt Bridge Works of Pittsburgh, whose works are at Canonsburg, Pa. The structural steel will be furnished by the Carnegie Steel Company, who have agreed to make quick delivery of same. The plans for the new building are for both a main exhibition hall and an assemblage or music hall. The main exhibition building is to be constructed of steel, brick and terra cotta. It will be 350 x 160 feet. The center of the building will rise 70 feet above the ground. Extending across it will be 20 immense arched trusses of 160 foot span. The assemblage or music hall will be of steel, terra cotta, brick and concrete, and will have a seating capacity of 5500. The builders are under contract to have the buildings completed in time for the opening of the exposition in September next.

Information Wanted.—A correspondent wishes the address of manufacturers producing cast iron gates for coal dock pockets.

The Iron and Metal Trades.

The announcement of the organization of the United States Steel Corporation has brought some surprises, notably as to the absence in the directory of a larger representation of the principal men in some of the constituent concerns. The scope of the new concern, which was outlined by *The Iron Age* of February 14, is now being enlarged, more particularly through the acquisition of additional Ore properties. The Oliver sixth of the Oliver Iron Mining Company not controlled by the Carnegie Steel Company has been added; the Aragon, with a product of 400,000 tons, has been purchased, and an option has been secured on the Cleveland-Cliffs Company, the most extensive and valuable of the outside concerns, with their transportation interests and their charcoal furnaces. It is a fact, too, that negotiations are pending for the purchase of some of the large steel plants which still linger in single glory.

The Iron markets are very strong throughout, and every suspicion of manipulation to help along the floating of the great consolidation has disappeared. The demand in every direction proves to be enormous, and there is no doubt but what it has, for the present at least, outrun the active capacity, great though it be. Pig Iron for Steel purposes for prompt delivery continues very scarce and Billets are simply unobtainable for early shipment. In fact, some of the rolling mills belonging to the consolidation are idle because the Steel plants cannot furnish them with material. Premiums are the rule, not alone for Steel, but also for a large variety of finished products, and heavy orders are being placed.

As yet there are no indications that the danger point in values has been reached, although some of the most conservative of consolidation managers avow that it is not far off.

There are no signs of speculation anywhere, but, on the contrary, there is a growing disposition to cover requirements for more distant deliveries, in some cases into the fourth quarter.

In Foundry Irons buyers representing a wide variety of consumptive requirements are still coming into the market, and good purchases continue, in spite of the fact that the Southern furnaces are now asking \$11.75 for No. 2 Foundry, f.o.b. Birmingham. As an instance how great the change has been we may cite the fact that one leading company last week made shipments to Europe on old contracts which netted only \$7.50 at the furnace.

Another instance of the sharp struggle which European manufacturers are engaged in against American competition is furnished by the bids for the second instalment of the famous Java Cast Iron Water Pipe order. The first, for about 3500 tons, was taken by R. D. Wood & Co. of Philadelphia, last year. The second, for about 3600 tons, has just been captured by the large French works at Pont-a-Mousson, at a figure which, it is claimed, was \$4 per ton below the lowest American bid.

A Comparison of Prices.

At date, one week, one month and one year previous.

Advances Over the Previous Month in Heavy Type. Declines in Italics.

APRIL 3. MAR. 27. MAR. 6. APR. 4.
1901. 1901. 1901. 1900.

PIG IRON:				
Foundry Pig, No. 2, Standard, Philadelphia	\$15.50	\$15.40	\$15.25	\$21.75
Foundry Pig, No. 2, Southern, Cincinnati	14.50	14.50	18.25	20.25
Foundry Pig, No. 2, Local, Chicago	15.50	15.50	14.50	23.50
Bessemer Pig, Pittsburgh	16.75	16.75	18.50	24.00
Gray Forge, Pittsburgh	14.50	14.50	18.00	21.00
Lake Superior Charcoal, Chicago	18.00	18.00	17.50	25.50

BILLETS, RAILS, ETC.:

Steel Billets, Pittsburgh (nom.)	24.00	24.00	19.75	38.00
Steel Billets, Philadelphia (nom.)	26.00	26.00	21.00	35.00
Steel Billets, Chicago (nom.)	25.00	25.00	20.75	nom.
Wire Rods (delivered)	36.00	36.00	35.00	nom.
Steel Rails, Heavy, Eastern Mill	26.00	26.00	26.00	35.00
Spikes, Tidewater	1.60	1.55	1.50	2.00
Splice Bars, Tidewater	1.40	1.35	1.30	2.20

OLD MATERIAL:

Steel Rails, Chicago, gross ton...	14.50	14.00	14.00	18.00
O Steel Rails, Philadelphia	17.00	16.00	15.50	23.50
O Iron Rails, Chicago, gross ton...	20.00	19.50	17.00	22.00
O Iron Rails, Philadelphia	19.50	19.50	18.00	24.00
O Car Wheels, Chicago, gross ton...	16.50	...	16.50	24.00
O Car Wheels, Philadelphia	16.50	16.50	17.00	23.00
Heavy Steel Scrap, Chicago, gr. ton	14.00	13.50	12.00	17.00

FINISHED IRON AND STEEL:

Refined Iron Bars, Philadelphia	1.40	1.40	1.40	2.10
Common Iron Bars, Chicago	1.60	1.55	1.45	2.30
Common Iron Bars, Youngstown	1.15	1.40	1.30	2.15
Steel Bars, Tidewater	1.60	1.55	1.38	2.40
Steel Bars, Pittsburgh	1.50	1.45	1.25	2.25
Tank Plates, Tidewater	1.70	1.65	1.55	2.05
Tank Plates, Pittsburgh	1.50	1.50	1.40	1.90
Beams, Tidewater	1.75	1.75	1.63	2.40
Beams, Pittsburgh	1.60	1.60	1.50	2.25
Angles, Tidewater	1.75	1.75	1.58	2.40
Angles, Pittsburgh	1.60	1.60	1.40	2.25
Skelp, Grooved Iron, Pittsburgh	1.75	1.70	1.45	1.97 $\frac{1}{4}$
Skelp, Sheared Iron, Pittsburgh	1.75	1.75	1.50	2.10
Sheets, No. 27, Pittsburgh	3.25	3.25	2.85	3.10
Barb Wire, f.o.b. Pittsburgh	2.90	2.90	2.90	3.80
Wire Nails, f.o.b. Pittsburgh	2.30	2.30	2.30	3.20
Cut Nails, Mill	2.00	2.00	2.00	2.50

METALS:

Copper, New York	17.00	17.00	16.87 $\frac{1}{2}$	17.00
Spelter, St. Louis	3.75	3.72 $\frac{1}{2}$	3.77 $\frac{1}{2}$	4.40
Lead, New York	4.37 $\frac{1}{2}$	4.37 $\frac{1}{2}$	4.37 $\frac{1}{2}$	4.70
Lead, St. Louis	4.22$\frac{1}{2}$	4.22 $\frac{1}{2}$	4.17 $\frac{1}{2}$	4.57 $\frac{1}{2}$
Tin, New York	25.50	26.15	26.35	31.75
Antimony, Hallett, New York	8.75	8.75	9.25	9.75
Nickel, New York	55.00	55.00	55.00	58.00
Tin Plate, Domestic Bessemer, 100 lbs., New York	4.19	4.19	4.19	4.84

Chicago. (By Telegraph.)

Office of *The Iron Age*, 1905 Fisher Building,
CHICAGO, April 3, 1901.

Activity continues to characterize all branches of the Iron trade. It would seem as if nearly every consumer either needs additional material to cover immediate necessities or feels impelled to anticipate the future. Conditions are quite similar to those prevailing in the spring of 1899, preceding the boom. Contracts are being placed for deliveries beginning months ahead. More of this kind of buying would be done if manufacturers were willing to so far anticipate the future.

Pig Iron.—A general air of satisfaction pervades all sales offices. Business continues heavy. Among the sales for the past week was one of 10,000 tons of Gray Forge. The foundrymen are buying freely for delivery during the last half of the year. Contracts of this kind have frequently called for 1000 tons, but in few cases has this been exceeded. The Malleable foundrymen are helping materially to swell the volume of business. Quite a number are buying for delivery beginning this month and running through the year. The largest Malleable foundrymen are not yet in the market, but from the indications it is believed that they soon will be. It is worthy of note that the Silvery Irons are now in better demand, as for some time they have been in unusually good supply and have not been moving very freely. The

Southern furnace companies have advanced prices 25c. and quotations are revised accordingly. We quote as follows, Chicago delivery:

Lake Superior Charcoal	\$18.00 to \$18.50
Local Coke Foundry, No. 1	16.00 to 16.50
Local Coke Foundry, No. 2	15.50 to 16.00
Local Coke Foundry, No. 3	15.00 to 15.50
Local Scotch, No. 1	16.25 to 16.50
Ohio Strong Softeners, No. 1	16.50 to 16.75
Southern Silvery, according to Silicon	16.15 to 16.60
Southern Coke, No. 1	16.15 to 16.60
Southern Coke, No. 2	15.40 to 15.90
Southern Coke, No. 3	14.90 to 14.50
Southern Coke, No. 1 Soft	15.90 to 16.40
Southern Coke, No. 2 Soft	15.40 to 15.90
Foundry Forge	14.40 to 14.65
Gray Forge and Mottled	13.90 to 14.15
Southern Charcoal Softeners, according to Silicon	15.50 to 17.00
Tennessee Silicon Pig	17.00 to 18.00
Alabama and Georgia Car Wheel	20.65 to 21.00
Malleable Bessemer	16.50 to 17.00
Standard Bessemer	18.00 to 18.50
Jackson County and Kentucky Silvery, 8 per cent. Silicon	17.50 to 18.00

Bars.—The orders placed during the past week included a considerable number running into heavy tonnage. It is believed that the sales during this period were larger by far than any week for some time. The effect is seen in advancing prices. The implement manufacturers are expected to begin to place orders this week, but it will not be surprising if they decide to postpone buying in the hope of securing lower prices a little later. Mill shipments are now quoted at 1.60c. to 1.65c., Chicago, for Common Bar Iron; 1.65c. to 1.70c. for Soft Steel Bars, and 1.90c., base, for Hoops. Jobbers find no abatement in the draft on their stocks, but, on the contrary, report that a heavier demand is being received from consumers who usually purchase direct from the mills. Stocks are more badly broken than last week, and buyers do not question the prices asked if they can only secure what they need. Small lots from stock are held at 1.90c. to 2c. in either Iron or Steel Bars, and 2.20c. to 2.25c., base, for Hoops.

Car Material.—The demand for all kinds of material for cars is incessant. A considerable part of the present volume of business is still due to the activity in building rolling stock for the railroads. The condition of this branch of business is shown by the fact that the leading manufacturers of Car Axles have their capacity sold up to the end of year.

Structural Material.—A great deal of business was closed up last week on account of the advance in prices. Nearly all the large projects which had been protected by manufacturers were closed. The Tribune Building is one of these, taking about 3000 tons of material. Quite a number of other buildings were placed under contract, orders running from 2000 tons down. The tonnage thus taken was very large. Quite a good demand is reported for small quantities. Mill shipments are quoted as follows: Beams, Channels and Zees, 15 inches and under, 1.65c.; 18 inches and over, 1.85c.; Angles, 1.75c. rates; Tees, 1.80c.; Universal Plates, 1.65c. to 1.75c.; small lots of Beams and Channels from local yards are quoted at 2.25c.; Angles, 2c. rates; Tees, 2.15c.

Plates.—All interests report activity. The local mills and outside mills having local agencies, as well as the Jobbing houses, have enjoyed excellent business. Large orders are in sight and prospects point to an even better condition of trade than the very satisfactory demand enjoyed in March. Jobbers' stocks are being drawn upon to a much greater extent to supply pressing requirements of consumers. Mill shipments of Tank Plate, $\frac{1}{4}$ -inch and heavier, in carload lots, are firm at 1.65c. to 1.70c., Chicago; Flange, 1.75c.; Marine, 1.85c. Jobbers quote small lots from store at 2c. for Tank and 2.25c. for Flange.

Sheets.—Large consumers and part of the jobbing trade are still short of stock and are appealing to the manufacturers to be taken care of. It seems as if the demand grows instead of diminishing. Mill shipments of No. 27 Black are quoted at 3.40c., Chicago, for carload lots, and Galvanized at 70 per cent. off. Jobbers are having a big demand from store. The excellent condition of business has not caused all jobbers to advance prices universally. Some quote small lots from stock at 3.65c. for No. 27 Black; others are still selling at 3.50c. Galvanized in the same way can be purchased from some at

about the same price as that asked for mill shipments, while few have advanced their rates above 65 and 10 off. Other gauges are quoted as follows: No. 18, 3c.; No. 16, 2.70c.; No. 14, 2.55c. to 2.65c.; No. 12, 2.40c.; No. 10, 2.30c., and Wood's Smooth, 3.85c.

Merchant Pipe.—Trade is active, the demand running into a large tonnage. Manufacturers' prices, random lengths, are as follows:

	Less than In carloads.	carloads.
Blk. Galvd.	Blk. Galvd.	
$\frac{1}{2}$ to $\frac{1}{2}$ inch and 11 to 12 inches	59.2	46.2
$\frac{3}{4}$ to 10 inches	66.7	53.3
	61.9	49.9

Boiler Tubes.—Jobbers have advanced their rates from store, owing to the higher prices now made by manufacturers. A new price-list will be issued this week.

Rails and Track Supplies.—Sales of Heavy Sections of Steel Rails during the week totaled about 15,000 tons. The demand keeps up very steady and more business is in sight. Quite a number of electric lines of rather ambitious mileages are being promoted in this and adjoining States which will take large quantities of Rails if they are consummated. Light Rails are in excellent demand. Heavy Sections are still quoted at \$26, while Light Sections are held at \$28.50 for mill shipments of 12 and 16 lbs. Jobbers quote small lots of Light Rails from stock at 1.80c. to 2c. Splice Bars are quoted at 1.50c. to 1.60c.; Spikes, 1.80c. to 1.85c.; Track Bolts, with Hexagon Nuts, 2.55c. to 2.60c., and Square Nuts, 2.40c. to 2.45c., carload lots, and small lots from stock command much higher prices.

Merchant Steel.—The disposition to place contracts is increasing, although manufacturers are so full of work that they prefer to take small orders rather than large ones. Mill shipments, Chicago delivery, are quoted as follows: Smooth Finished Machinery Steel, 2c. to 2.10c.; Smooth Finished Tire, 1.85c. to 2c.; Open Hearth Spring Steel, 2.30c. to 2.40c.; Toe Calk, 2.40c. to 2.60c.; Sleigh Shoe, 1.85c. to 1.90c.; Cutter Shoe, 2.40c. to 2.60c.; Cold Rolled Shafting, 55 off. Ordinary grades of Crucible Tool Steel are quoted at 6c. for carloads and 7c. from store; Specials, 13c. upward.

Old Material.—The market appears to be gradually getting more under the control of dealers. They have for some time been purchasing nearly all railroad offerings, bidding higher prices than the mills; they have consequently succeeded to some extent in advancing prices. It is possible that purchases can be made from some outside holders at lower rates than those prevailing in and about Chicago. The following are approximate quotations per gross ton:

Old Iron Rails	\$20.00 to \$21.00
Old Steel Rails, mixed lengths	14.50 to 15.50
Old Steel Rails, long lengths	16.50 to 17.50
Heavy Relaying Rails	20.00 to 22.00
Old Car Wheels	16.50 to 17.00
Heavy Melting Steel Scrap	14.00 to 14.50
Mixed Steel	12.00 to 13.00

The following quotations are per net ton:

Iron Fish Plates	\$18.50 to \$19.00
Iron Car Axles	20.00 to 20.50
Steel Car Axles	16.00 to 16.50
No. 1 Railroad Wrought	17.00 to 17.50
No. 2 Railroad Wrought	15.50 to 16.00
Shafting	16.00 to 16.50
No. 1 Dealers' Forge	14.00 to 15.00
No. 1 Busheling and Wrought Pipe	12.50 to 13.50
Iron Axle Turnings	11.00 to 11.50
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	9.50 to 10.00
Cast Boltings	4.00 to 4.25
Mixed Boltings, &c.	4.50 to 4.75
No. 1 Boilers, cut	13.00 to 13.50
No. 2 Boilers, cut	10.00 to 10.50
Heavy Cast Scrap	12.50 to 13.00
Stove Plate and Light Cast Scrap	9.00 to 9.50
Railroad Malleable	12.00 to 12.50
Agricultural Malleable	11.00 to 11.50

Metals.—Copper is steadily held at quotations recently ruling—namely, 17 $\frac{1}{4}$ c. for carload lots of Lake and 17 $\frac{1}{4}$ c. for Casting brands. The demand for Pig Lead is a little stronger, but prices are unchanged at 4.32 $\frac{1}{4}$ c. for Desilverized and 4.42 $\frac{1}{4}$ c. for Corroding in 50-ton lots.

Coke.—Sales agents report a big demand. Large consumers are freely placing contracts for their requirements running through the year. Quotations are continued at \$4.85 to \$5 for 72-hour Foundry Connellsville Coke.

Charles L. Miner has been formally appointed manager of the Western branch of Matthew Addy & Co., Pig

Iron commission merchants. Mr. Miner has been filling the duties of this position for a long time and his services are thus recognized. His office is located in the Rookery Building, Chicago.

Philadelphia.

Office of *The Iron Age*, Forrest Building, Philadelphia, Pa., April 2, 1901.

There is a stronger tone to the Iron and Steel markets, and as a rule a very considerable degree of activity, with the possible exception of Foundry and Mill Irons, which at the advanced prices now asked are not taken with much freedom. Pigs for Steel making are in very active demand and are commanding higher prices, but supplies appear to be exhausted temporarily, and it is difficult to secure a quotation, either Basic or Bessemer, for any delivery this side of midsummer. In the more advanced products there is an almost unprecedented demand, and manufacturers, particularly of Plates and Sheets, find it quite impossible to meet buyers' requirements with reasonable promptitude. Foundrymen, machinists, engineers and similar industries are all running to their fullest limits, while the heavier industries, such as bridge, locomotive and ship builders, are surpassing all former records in the amount of material that they are using. Prospects are in all respects of the most promising character, so that no thought is given to possible reactions. Prices are thought to be high enough, however, and while this market has been relatively lower than those further West, yet there is only a moderate response to the increasing scarcity, due to the diversion of Iron to other centers. The price of Ores will probably be announced before the close of the week, and this will no doubt remove one important element of uncertainty, but there is an impression that there will not be much change in the general average of prices as they appear to-day.

Pig Iron.—There is a decidedly better feeling in Pig Iron, and sellers are not disposed to accept business unless they can secure 25c. to 50c. advance from the low figures of last month. There are some boomers who talk much higher prices, but a good buyer can get all the Iron he wants at \$15 to \$15.25 for No. 2 Plain, and \$15.50 to \$15.75 for No. 2 X. Some quote 50c. above these figures and get it in a small way, but there are others, chiefly boomers, who go 25c. below the low figures named, and in some cases they will beat that sooner than lose a trade, and then accuse other people for quoting unnecessarily low prices. Apart from that the market is undoubtedly better, and for good Irons it looks as though consumers would have to pay more money during the second quarter of the year than they paid during the first quarter. Basic Iron is cleaned up completely, and it is doubtful if any business could be placed except for deliveries during the last half of the year, for which about \$14.50 at furnace is quoted. Bessemer is also wanted at about \$15 at furnace, and could be placed in liberal quantities at that figure. Mill Irons and No. 3 Foundry are in good demand with sales at somewhat irregular prices; the range probably would be within \$13.75 and \$14.50, but stocks are pretty well cleaned up, and prices rather uncertain. General quotations for seaboard or nearby points, however, would be about as follows: No. 1 X Foundry, \$16 to \$16.25; No. 2 X Foundry, \$15.25 to \$15.75; No. 2 Plain, \$14.75 to \$15; Standard Gray Forge, \$14 to \$14.50; Ordinary Gray Forge, \$13.50 to \$13.75; Basic (Chilled), \$14.50 to \$14.75, furnace, and Standard Bessemer, \$15 to \$15.25 at furnace.

Billets.—There is no great demand at present for Bessemer Steel, consumers having pretty well supplied themselves for the next 60 or 90 days. Special grades are selling, however, at \$28 to \$30, while ordinary Steel is quoted at about \$26.50.

Plates.—There seems to be an almost unlimited demand, and makers have no difficulty in getting 1.70c. to 1.75c. when they can guarantee satisfactory deliveries. Consumption is undoubtedly on the largest scale ever known, and prospects indicate a still larger business as the season advances. Bridge, shop and locomotive builders are taking enormous quantities, while

the small consumers appear to be all working to their fullest capacity. General quotations for city and nearby points are about as follows: Plates, $\frac{1}{4}$ -inch and thicker, 1.70c. to 1.75c.; Universals, 1.70c. to 1.75c.; Flange, 1.50c. to 1.80c.; Charcoal Iron Plates, C. H. No. 1, 2.25c.; Best Flange, 2.75c.; Fire Box, 3.25c.

Structural Material.—There is a great deal of business coming out, and the probabilities are that the mills will be overrun with work during the spring and summer months. There are a great many orders on the books, but in some cases specifications have not been coming forward as promptly as expected, consequently less progress has been made than would otherwise have been the case. A good many options were taken up before the advance went into effect, but manufacturers find no difficulty in getting plenty of business at about the following figures for seaboard or nearby points: Angles, 1.75c. to 1.85c.; Beams and Channels, 15-inch and upward, 1.75c. to 1.85c.

Bars.—Prices are very strong and average about \$1 per ton better than during last week, 1.45c. at mills being now regarded as an inside figure. A meeting of the Eastern Bar Iron Association is to be held at the Waldorf-Astoria in New York on Thursday, when it is expected that some plan will be adopted for pooling the interests of the mills east of the Alleghanies and probably some action may be taken in regard to prices, which in the meanwhile are as follows: Iron Bars, 1.40c. to 1.50c.; Steel Bars, 1.55c. to 1.65c.

Sheets.—The demand is utterly beyond precedent, and there would not be the least trouble in filling up the entire capacity of the mills for a year to come, providing that manufacturers would be willing to name price and accept the business. It is quite out of the question to give definite quotations on a market like this, as the difficulty would be to get any one to accept an order, but in a general way nominal rates would be about as follows for best Sheets (common Sheets two-tenths less): No. 10, 2.50c.; No. 14, 2.70c.; No. 16, 2.90c.; Nos. 18-20, 3.40c.; Nos. 21-24, 3.50c.; Nos. 26, 27, 3.65c.; No. 28, 3.75c. to 3.80c.

Old Material.—Steel is still advancing, and \$17 has been paid for Old Rails and Choice Heavy Melting Steel, but holders are now asking 25c. to 50c. advance. Prices along the entire line are firm but difficult to quote, but bids and offers are about as follows for deliveries in buyers' yards: Choice Railroad Scrap, \$19.50 to \$20.50; No. 1 Yard Scrap, \$13 to \$14; No. 2 Light Scrap, \$12 to \$13; Machinery Cast, \$14 to \$14.50; Heavy Steel Scrap, \$16.75 to \$17; Old Iron Rails, \$19.50 to \$20.50; Old Steel Rails, \$17 to \$17.50; Wrought Turnings, \$12 to \$12.50; Cast Borings, \$8 to \$8.25; Old Car Wheels, \$16.50 to \$17; Iron Axles, \$22 to \$23; Steel Axles, \$17 to \$18.

The Fairhill Rolling Mill of this city was sold at auction to-day to close the estate of a deceased partner. The entire property, including real estate and plant, was bought in by the surviving partner, W. C. Gaulbert, who will continue the business.

Cincinnati. (By Telegraph.)

Office of *The Iron Age*, Fifth and Main streets. CINCINNATI, April 3, 1901.

The best that can be said is none too good for the Pig Iron market at this writing. In spite of the fact that an additional rise of 25c. has been asked and obtained, the buying movement goes right along unchecked. From no particular locality is the business coming in, but every point where there are buyers located is represented in the week's ordering. Orders are averaging from 3000 tons downward, but few large deals have been in sight at all, and so far as known none have been closed up. Every class of consumers appear to be interested in the matter. Perhaps the main feature at this time is the utter absence of anything savoring of speculation. Speculators proper are not even figuring on buying, and the consumers are buying very conservatively and yet freely to cover all legitimate needs. There has been quite a good deal of buying for the last quarter of the year, thus showing that the belief in the permanence of the

present values is widespread. Quite a good deal of Malleable Iron has been sold, and Northern Iron has been much more active than for a few weeks past. Most of the Iron sold during the past week has been on the basis of \$11.75, Birmingham. The asking price now is pretty generally \$12. Consumption appears to be on the increase. Freight rate from Birmingham is \$2.75 to this point; from Hanging Rock district, \$1. We quote, f.o.b. Cincinnati:

Southern Coke, No. 1	\$15.00 to \$15.25
Southern Coke, No. 2	14.50 to 14.75
Southern Coke, No. 3	14.00 to 14.25
Southern Coke, No. 4	13.25 to 13.50
Southern Coke, No. 1 Soft	15.00 to 15.25
Southern Coke, No. 2 Soft	14.50 to 14.75
Southern Coke, Gray Forge	13.25 to 13.50
Southern Coke, Mottled	13.25 to 13.50
Ohio Silvery, No. 1	17.00 to 17.50
Ohio Silvery, No. 2	16.00 to 16.50
Lake Superior Coke, No. 1	15.75 to 16.00
Lake Superior Coke, No. 2	14.75 to 15.00
Lake Superior Coke, No. 3	13.75 to 14.00
Southern Basic	14.50 to 14.75

Car Wheel and Malleable Irons.

Standard Southern Car Wheel, chilling grades	\$18.75 to \$19.25
Standard Southern Car Wheel, No. 2	17.75 to 18.25
Lake Superior Car Wheel and Malleable	18.50 to 19.00

Plates and Bars.—The market is practically unchanged and continues quite strong and active. We quote, f.o.b. Cincinnati: Iron Bars, in carload lots, 1.55c., with half extras; in small lots, 1.75c., with full extras. Steel Bars, in carload lots, 1.52c., with half Steel card extras; Base Angles, in carload lots, 1.75c.; Plates, 1.80c. for $\frac{1}{4}$ -inch and heavier; Sheets, No. 10, 2.05c.

Old Material.—There is a good healthy tone to the market, and price-lists while unchanged are strongly lived up to. Dealers' buying prices per gross ton are, f.o.b. Cincinnati: No. 1 Wrought Railroad Scrap, \$15.50; Cast Railroad and Machine Scrap, \$11; Old Iron Axles, \$16.75; Iron Rails, \$18; Steel Rails, rolling mill lengths, \$13; Short Lengths, \$12; Car Wheels, \$15.

Cleveland.

CLEVELAND, OHIO, April 2, 1901.

Iron Ore.—Negotiations for mining property seem to consume the entire attention of the Ore producers now, and all such matters as prices and sales for the year must wait upon the conclusion of pending actions. This week it became known that the United States Steel Corporation are trying to buy in the Aragon mine, now owned by Oglebay, Norton & Co. of this city. The mine has a capacity of between 400,000 and 500,000 tons a year. It is expected that the deal will be closed in a very short time. The statement made by Corrigan & McKinney is that several of their largest mines are under negotiation with the same corporation and may be sold presently. Until these deals are settled it is hardly expected that season's prices will be fixed. It was expected that a meeting of the Ore Association would be held this week to fix prices, but that elusive date is now as far away as ever. No attempt has been made so far and no one seems to know just when it will be held. The discussion now tends more strongly than ever to indicate that the prices may be even a little higher than they were last year. The talk of lake freights has increased greatly and the situation has materially changed in a week. The vessel owners have taken a united stand in deciding to fight the marine engineers and are now filling the vacant places with men brought from all quarters of the country. This being the case, it remains only a question of ice and desire until the season of navigation shall open. The ice reports indicate that the Straits and Soo passage are still filled with heavy ice, so that the first boats are hardly expected to be running much before May 1.

Pig Iron.—The market is again on the boom and the buying continues very heavy. Rumors of a consolidation of the interests are still going in a very vague way, but have lost their power to affect the market. It is generally understood, however, that options have been taken on all the merchant plants in the Valley, one in Cleveland and one in Pittsburgh that will be exercised shortly. The undertaking also implies a determination to purchase the other plants when the temporary organization has been effected. The options being held on these fur-

naces prevent the furnacemen selling the product beyond the period of its life. Up until July 1 most of the furnace product in this locality has been entirely sold. Bessemer supplies have practically been exhausted, but what there is left to sell is going at \$16.50, in the Valley, although even carload lots are limited in number. Basic is also about sold up and the quotation upon that grade is necessarily nominal. It stands at \$16, at the furnace. Foundry Irons have made a slight advance this week. No. 2 has been sold at \$14.75 and \$15, at the furnaces, and the demand has been strong enough to admit of the assertion that \$15 practically prevails now as the price. No. 1 is sold at \$15.25 and \$15.50.

Finished Material.—The advance in the price of Structural Shapes, putting them all upon a basis of 1.60c. at the Pittsburgh mills, has only affected the market by bringing out a great deal of business that was not in position to take advantage of the information that an advance was coming. Since the increase was quoted the market has had inquiries for about 4000 tons of material, some of the orders having been placed during the last week. The old orders spoken of a week ago were all closed before the advance came. The business in this line has been very active this week therefore. The price of billets has gone far beyond any expectation this week. The supply is practically exhausted and it is no longer a matter of price with the buyers, the supply of the material being the essential thing. This has caused consumers to make some extravagant offers and to pay altogether abnormal prices. Some material has been sold this week both in Bessemer and Open Hearth Billets at \$27 and \$28 a ton, the latter being nearer to the general run of values. As this indicates, prices have advanced at least \$4 a ton this week. The Steel Rail trade has been active all week also. Something like 5000 tons have been taken in by the big electric lines, the needs of the steam roads having been covered for the present. Building work has already been started and the shipments have been large. The mills are becoming congested to a very large degree, reports being made that the capacities of some of them have been covered until November 1. A large inquiry for Bars has appeared this week. The orders are numerous and the outlook is very bright. The inquiries amounted to about 4000 tons. The price remains at 1.45c., at the Pittsburgh mills. The demand for Plates has been moderate of late. Shipments are now possible on order within three weeks, and it develops that some of the orders recently taken were "blinds" that covered possible requirements and aimed at taking advantage of the low price to get under cover before an advance came. No change has been made in the price, and the only change in the market is in the favorable attitude of the mills toward the consumer as to deliveries. Some of the Pittsburgh mills are demanding premiums on prompt deliveries and are having no trouble to obtain them.

Old Iron.—Conditions in the Scrap trade remain unchanged. The prices quoted are as follows: No. 1 Wrought, \$17.50 net; No. 1 Cast, \$13 net; Old Iron Rails, \$21 gross; Old Steel Rails, \$16 gross; Car Wheels, \$19 gross; Cast Borings, \$6.50 net; Wrought Turnings, \$10 net.

St. Louis.

Office of *The Iron Age*, 1205 Chemical Building, St. Louis, April 2, 1901.

Pig Iron.—The trade report that some very good sales of Pig Iron were made last week. The largest individual order heard of was for 1600 tons. Orders were numerous and covered mainly 300 to 1000 ton lots. The tonnage for the week did not, however, equal that of its immediate predecessors. Stove foundries bought largely of Southern Irons. According to all reports the jobbing trade is very active. Agricultural implement makers are asking to have shipping dates advanced, and in no case thus far has any buyer asked to have Iron held back. Furnace capacity is very well sold up and a number of producers are now only willing to take orders for delivery from September to December. Rumor had it that another advance was to have taken place last

Friday. It is learned that it was held off, but that the market is on the eve of another upward move. The trade feel that business will keep in good form provided that prices are not moved up too rapidly. We quote, f.o.b. St. Louis:

Southern, No. 1 Foundry.....	\$15.25 to \$15.50
Southern, No. 2 Foundry.....	14.75 to 15.00
Southern, No. 3 Foundry.....	14.25 to 14.50
Southern, No. 4 Foundry.....	13.75 to 14.00
No. 1 Soft.....	15.25 to 15.50
No. 2 Soft.....	14.75 to 15.00
Gray Forge.....	13.50 to 13.75

Bars.—The strong demand for Bars continues without a check. Mills are cautious about taking new business and scrutinize specifications very closely. Makers are only taking such orders as can be filled within a reasonable time and will not sell for future delivery. Structural Shapes and Plates are in heavy inquiry. The recent advances in Angles and Beams have not yet had any effect on demand. Sales of Hoops and Bands are quite extensive. The trade is buying freely of jobbers and carload orders are quite numerous. Something was said during the past few days about again advancing the jobbers' price on Bars, but so far the quotations of last week remain unchanged. Mills quote Iron and Steel Bars, 1.60c. to 1.65c., half extras, East St. Louis. Jobbers' prices are 1.75c. to 1.80c., full extras, carloads, and 1.80c. to 2c., full extras, in small lots.

Rails and Track Supplies.—Orders for carloads of Track Supplies are being freely placed. The date of delivery in almost every instance is considered as of the greatest importance, and stress is laid on that point. Makers of Bolts and Spikes are reported as running their plants to extreme capacity. Miscellaneous supplies for railroads are in remarkable heavy movement. Prices on Track Supplies are slightly higher. We quote: Steel Splice Bars, 1.65c. to 1.75c.; Bolts, with Square Nuts, 2.45c.; with Hexagon Nuts, 2.60c.; Spikes, 1.80c. to 1.90c.

Pig Lead.—No change in the Pig Lead market. Demand is still strong and inquiry is now had for May shipments. Missouri brands are obtainable at 4.22½c. to 4.25c.; Desilverized at 4.32½c. Lead Ore receded to \$46 per ton.

Spelter.—Last week's inquiries resulted in some desirable orders for Spelter being placed. Owing to the large business which has been booked ahead the floating new wants are not at present for heavy amounts. A small lot sold at 3.80c. The market may be quoted at 3.75c. to 3.77½c. Zinc Ore sold at \$27.50 per ton as the top price.

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, Pittsburgh, April 2, 1901.

The Directory of the United States Steel Corporation, official announcement of which was made on Monday, together with the selection of Charles M. Schwab as president, gives much satisfaction to the trade here, the general opinion being that better selections for the important positions could not have been made. The fact that H. C. Frick has been placed on the Board of Directors is particularly pleasing to his many friends in this city and elsewhere. Conditions in the Iron trade remain about as heretofore, demand being heavy for all kinds of material, and premiums being secured by sellers that are able to make anything like prompt deliveries. In fact, a seller can pretty nearly name his own price, and get it, where he can ship out promptly. Pig Iron for April shipment has sold at \$16, at Valley furnace, but for May and June could be bought at a lower price. A good deal of Eastern Bessemer Iron is being offered in the Pittsburgh market at lower prices than the Valley furnaces are naming. There is not much doing in Steel in this district, as nearly all the consumers are pretty well covered. Finished Material continues very active in demand, and premiums of \$2 to \$3 a ton are paid by buyers in many cases to get stuff.

Ferromanganese.—There has been no advance in price, and we continue to quote 80 per cent. domestic or foreign Ferro at \$62.50 in carload lots, delivered at

buyer's mill. Some foreign Ferro has recently been sold in this market at the above price. For small lots and prompt shipment higher prices are obtained.

Structural Material.—Some large jobs have been given out in the past week. The American Bridge Company have taken a number of additional orders for export, involving a very large tonnage, and in addition have secured the train shed for the new Union Depot. The Fort Pitt Bridge Company have the new exposition buildings, the material for both of these jobs going to the Carnegie Steel Company. The Structural mills all have a heavy tonnage on their books and are running to full capacity. As stated before in this report, indications are that tonnage in Structural Steel this year will be away ahead of any previous year. The advanced prices are being firmly held, and we quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 up to 6 x 6 inch, 1.60c.; smaller sizes, 1.55c. to 1.60c.; Zees, 1.60c.; Tees, 1.65c.; Steel Bars, 1.45c. to 1.50c., base, half extras, at mill; Universal and Sheared Plates, 1.50c. to 1.60c., the latter for prompt delivery. All the above prices are f.o.b., Pittsburgh.

Plates.—While the agreed price of Plates is 1.50c., minimum, for Tank, $\frac{1}{4}$ -inch and heavier, they have sold at 1.75c. at mill for prompt shipment. In small lots of a few tons as high as 2c. has been paid. The general demand for Plates is heavy, and the mills have all the work they can do. For prompt shipment we quote: Tank Plate, $\frac{1}{4}$ -inch and heavier, 1.60c. to 1.75c. at mill, with the usual differentials for the higher grades. The official prices on Plates are as follows: Tank quality, $\frac{1}{4}$ -inch and heavier, 1.50c.; 3-16 inch, 1.55c.; under 3-16 inch and above No. 10, 1.60c.; Flange or Boiler Steel, 0.1c. advance over the base of Tank; Marine and Fire Box, American Boiler Manufacturers' Association specifications, 0.2c. advance over Tank; Still Bottom Steel, 0.3c. advance over Tank; Locomotive Fire Box Steel and equivalent specifications, 0.5c. advance over Tank, all f.o.b. Pittsburgh.

Sheets.—Large consumers of Sheets, who have been disappointed in getting deliveries, are paying as much as \$2 a ton premium to other mills to get prompt shipments. Jobbers who have Sheets in stock and can ship out promptly can pretty nearly name their own prices and get them. We quote No. 27 Black Sheets, box annealed, one pass, at 3.25c., and No. 28, 3.35c. For small lots and prompt shipment, \$2 to \$3 a ton advance on these prices is being paid. Galvanized Sheets are held at 70 and 5 per cent., but for early delivery are selling at 70 off at mill.

Bars.—Tonnage is heavy in both Iron and Steel Bars and the mills are congested with business. Prices have again advanced, and the minimum price of Steel Bars is 1.50c., base, at mill, half extras. Common Iron Bars are quoted at 1.45c. to 1.50c. at Valley mill, with some dealers holding firmly for the higher price. Some large inquiries for Steel Bars and other Shapes are in the market for extended delivery. We quote Refined Iron Bars, made from all Muck Bar stock, at 1.65c. to 1.75c., maker's mill.

Skelp.—There is a heavy demand for both Iron and Steel Skelp, and very little to be had. The leading Pipe interest have started up another works, and will be larger buyers of Skelp than before. Grooved and Sheared Iron Skelp has sold at 1.75c. at mill, and for prompt delivery would probably bring 1.85c. to 1.90c. Steel Skelp has been quoted as high as 1.75c., Wheeling. The market is all of that price or higher.

Merchant Steel.—There is a good general demand and some season contracts have recently been placed. The mills are filled up and prompt deliveries are hard to get. We quote: Plow Slabs, $\frac{1}{4}$ -inch and heavier, 1.70c., base; Tire, 1.60c.; Toe Calk, 1.75c.; Bessemer Machinery Steel, 1.50c.; Smooth Finished Steel, 1.75c.; Rolled Lay Steel, 2.75c.; Hammered Lay Steel, 3.50c.; Plow Slabs, 1.80c.; Cold Rolled and Cold Drawn Shafting, 55 per cent. off in carload lots, 50 per cent. in less than carload lots, delivered in base territory. Tool Steel, 7c. and upward, according to quality. On Tool Steel freight is allowed east of the Mississippi River.

Tubular Goods.—The National Tube Company have started up their Oil City works, which have been idle since last summer. There is a good demand for Pipe, and some of the outside mills are talking higher prices. Jobbers are able to get better prices from the small trade, but the leading interest have not made any change in quotations. A very large amount of Oil Well Supplies is being shipped out of Pittsburgh to the new oil district in Texas. The gusher that came in the other day brought additional hurry up orders. Jobbers quote the small trade as follows:

<i>Merchant Pipe.</i>		Per cent.	Per cent.
		Black.	Galvd.
16 to $\frac{1}{2}$ inch and 11 to 12 inch.....		61	48
$\frac{3}{4}$ to 10 inch.....		68 $\frac{1}{2}$	56
<i>Casing, Random Lengths.</i>		S. & S.	I. J.
2 to 3 inch.....		58	53 $\frac{1}{2}$
3 $\frac{1}{4}$ to 4 inch.....		63	59
4 $\frac{1}{4}$ to 12 $\frac{1}{2}$ inch.....		65	61 $\frac{1}{2}$
<i>Casing, Cut Lengths.</i>		S. & S.	I. J.
2 to 3 inch.....		53 $\frac{1}{2}$	59
3 $\frac{1}{4}$ to 4 inch.....		59	55
4 $\frac{1}{4}$ to 12 $\frac{1}{2}$ inch.....		61 $\frac{1}{2}$	57 $\frac{1}{2}$
<i>Boiler Tubes.</i>		Up to 22 feet.	Per cent.
Steel.			
1 inch to 1 $\frac{1}{2}$ inch and 2 $\frac{1}{2}$ inch to 5 inch, inclusive.....		68 $\frac{1}{2}$	
2 inch to 2 $\frac{1}{2}$ inch, inclusive.....		63	
6 inch and larger.....		62	
Iron.			
1 inch to 1 $\frac{1}{2}$ inch and 2 $\frac{1}{2}$ inch.....		49 $\frac{1}{2}$	
1 $\frac{1}{4}$ to 2 $\frac{1}{2}$ inch.....		45	
2 $\frac{1}{4}$ to 13 inch.....		57	

Prices made by the mills to the jobbers are from 5 to 7 $\frac{1}{2}$ per cent. less than the above.

Coke.—The output of Coke in the Connellsville region last week was 231,000 tons, and for the first quarter of this year will amount to 3,000,000 tons or more. Production for the last three weeks has been at the rate of over 1,000,000 tons a month. Since the first of the year weekly tonnage has increased from 185,000 to 230,000 tons, and active ovens from 16,500 to nearly 20,000. Last week 19,675 ovens in the Connellsville region were active and only 772 idle. Shipments for the week were 10,900 cars. Prices on Coke are very firm and it is hard to get for prompt shipment. We quote strictly Connellsville Furnace Coke at \$2 a ton and 72-hour Foundry at \$2.50 a ton. Some brands of Foundry Coke are being offered at \$2.25 to \$2.35 a ton. Main Line Furnace Coke is held at about \$1.75, at oven.

Iron and Steel Scrap.—The Scrap market continues very active and prices are very firm. Some kinds of Scrap, especially heavy melting stock, are scarce, and are bringing higher prices. We quote: No. 1 Railroad Wrought Scrap, \$16.50 to \$17, net ton; Bessemer Melting Stock, \$16.50 to \$17; Low Phosphorus Melting Stock, \$19 to \$20; Old Iron Rails, \$20 to \$21, and very scarce. Busheling Scrap is \$14 to \$15, gross ton, and Old Steel Rails, \$17 to \$17.50.

Birmingham.

BIRMINGHAM, ALA., April 1, 1901.

Notwithstanding the advance in Iron as reported in last letter, the market the past week was a good one and sales were very fair. There was no scrambling for Iron, no undue eagerness manifested, but there was just a good, steady demand, which in amount indicated a good, healthy market. There were frequent orders for quick shipment, and the rejections of such orders about equaled in quantity what was accepted. The scarcity of some grades renders it very difficult in case of orders for mixed grades to have them filled by one interest. One large interest reports that for Nos. 1 and 2 Foundry and No. 2 Soft they can take no new orders up to July. Other interests report the same on other grades. Sales for the week were materially greater than the output, one interest reporting sales for the month as equal to the output of one and one-half months. There were sales of Gray Forge at \$10.50 and \$10.75, the latter price being paid for analysis test. In grade it would not pass for anything but Gray Forge, but in quality it passed on analysis as Superior. Basic Iron went at \$12, but in no large quantity. This grade, it has been frequently stated, was practically off the market. But on every advance some comes out and is absorbed. No. 4 Foundry

is \$10.75 and No. 3 Foundry is \$11.25. No. 2 Foundry sold at \$11.50 and \$11.75. No. 2 Soft is same price. Shipments are being urged as rapidly as possible and the shipping department of each interest is taxed to full capacity, and there is more or less complaint in this department as to delay in obtaining cars. The Republic Iron & Steel Company will blow in their No. 1 Furnace this week and the Sloss-Sheffield Company blew in their Lady Ensley Furnace at Sheffield on Saturday. This company have made a change in their furnace management, John H. Means retiring as superintendent and Hillman succeeding him. The Tutwiler Coal & Iron Company have increased their capital stock from \$50,000 to \$1,000,000, the Adlers going into it. Just how much of the increase is in solid cash is not stated. It is understood that a good bit of Ore and Coal lands enter into the combination, and one of the Messrs. Adler will be general manager of the corporation.

The combination mentioned in last letter as being negotiated is, for the time being, "off." But negotiations may be resumed at any time. The mention of official changes in last letter in the Sloss-Sheffield Company had substantial foundation. But no change has occurred and, for the present at least, none will be made.

The infusion of new blood into the management of some of our interests will work some radical changes and lead to new methods in the conduct of affairs.

The demand for Steel continues unabated and the mill management have no difficulty in placing their output, and could largely increase it if they had the capacity to do it. Work on the Rail mill is progressing favorably and every effort is being made to rapidly complete it.

The Austin-Bryan Company, makers of Steel Plows, &c., have commenced on the enlargement of their plant, of which mention was made some time ago. The enlargement will greatly add to its capacity.

The early reports sent out concerning our cyclone of last Monday were greatly exaggerated. The loss in property destroyed was less than \$200,000 and the loss of life was less than 20. But the loss of each fell on those least able to stand it. The storm had hardly passed before the work of relief commenced and subscriptions in money came pouring in. To the eternal credit of Birmingham, it was resolved that she would care for the sufferers without asking outside aid, and this spirit has met a noble response from all classes of her people. "What's the matter with Birmingham? She's all right!"

(By Telegraph.)

Reports of consolidation of the Sloss-Sheffield Company with the Tennessee Company are actively circulated. Officials will not discuss the matter. The Iron market is firm, with good sales at quotations given. Round lots are now in treaty. Steel is in fine demand; \$22 has been refused for Heavy Slabs and \$25 has been obtained for Car Axle Billets. Three thousand tons of No. 3 Foundry Iron were sold to-day at \$11.25. No. 2 Foundry is selling at \$11.75.

New York.

Office of *The Iron Age*, 232-238 William street, NEW YORK, April 3, 1901.

Pig Iron.—There has been a fair amount of activity, but Northern brands are still lagging behind the Southern Irons in the matter of price. We quote: Lehigh, Schuylkill and Virginia Irons, No. 1, \$16.50 to \$17.50; No. 2 X, \$15.50 to \$16; No. 2 Plain, \$14.25 to \$14.50; Gray Forge, \$14 to \$14.50; Tennessee and Alabama brands, No. 1 Foundry, \$16 to \$16.25; No. 2 Foundry, \$15.50 to \$15.75; No. 1 Soft, \$16 to \$16.25; No. 2 Soft, \$15.50 to \$15.75; No. 3 Foundry, \$14.50 to \$14.75; No. 4 Foundry, \$14.25 to \$14.50; Gray Forge, \$14.25 to \$14.50.

Cast Iron Pipe.—The Worcester order for about 800 tons has been taken by an outside shop. No large contracts are coming up for immediate settlement. We continue to quote \$23 to \$24 per gross ton, at tidewater.

Steel Rails.—The market has been rather quiet, both for domestic and foreign delivery. Some of the mills are so well supplied with orders until October that they

can only take care of the emergencies of regular customers. We quote \$26 for Standard Sections and \$32 to \$32.50 for Girder Rails. We quote Spikes, 1.60c. to 1.65c.; Splice Bars, 1.40c. to 1.45c.; Square Track Bolts, 2.10c. to 2.15c., and Hexagon Bolts, 2.20c. to 2.25c., at mill.

Finished Iron and Steel.—Some good orders have been placed for Structural Material for buildings in this city and we note a fair order for the new Clinical Hospital at Yale. The Lehigh Valley has placed some additional bridges of moderate size, and some pier work has also been taken. The markets are firm throughout. We quote as follows at tidewater: Beams, Channels and Zees, 1.75c. to 1.80c.; Angles, 1.75c. to 1.80c.; Tees, 1.80c. to 1.85c.; Bulb Angles and Deck Beams, 2c.; Sheared Steel Plates are 1.65c. to 1.70c. for Tank, 1.75c. to 1.80c. for Flange, 1.88c. to 1.90c. for Fire Box. Charcoal Iron Plates are held at 2.25c. for C. H. No. 1, 2.75c. for Flange, and 3.25c. for Fire Box. Refined Bars are 1.45c. to 1.50c.; Common Bars, 1.35c. to 1.40c.; Soft Steel Bars, 1.55c. to 1.60c., and Hoops, 1.90c. to 2c., base, on dock.

The United States Steel Corporation.

The announcement made by *The Iron Age* of February 14 as to the properties included in the plans of the great consolidation is now completely borne out by the latest circular issued by J. P. Morgan & Co.:

An offer is now made to exchange for each \$100, par value, of preferred stock of the American Bridge Company, \$110, par value, in the preferred stock of the United States Steel Corporation and for each \$100, par value, of the common stock of the Bridge Company, \$105 in the common stock of the United States Steel Corporation. It is also proposed to exchange for each \$100, par value, of the Lake Superior Consolidated Iron Mines, \$135, par value, in the preferred stock and \$135, par value, in the common stock of the United States Steel Corporation.

American Bridge preferred will be received ex-dividend payable April 24 next, but must carry all other dividends and rights to dividends declared or payable after that date. The Bridge common stock and the common stock of the Lake Superior Consolidated Iron Mines must carry all dividends and rights to dividends declared or payable after March 15. Dividends on the preferred stock of the United States Steel Corporation to be delivered to depositors are to begin to accrue from April 1, 1901. Arrangements have already been made for the acquisition upon the above basis of more than 85 per cent. of the stock of the Lake Superior Consolidated Iron Mines, embracing therein the interests of John D. Rockefeller.

Purchase of the Oliver Ore Interest.

Arrangements have also been made for the acquisition by the United States Steel Corporation of all the outstanding interest in the Oliver Iron Mining Company and the Pittsburgh Steamship Company not owned by the Carnegie Company. This refers to the one-sixth interest in the Oliver mines held by H. W. Oliver and his associates, the tonnage of which for a series of years was transferred to the National Steel Company. It is understood that Mr. Oliver declined the cash offered to him and his demand of payment in securities was finally acceded to, the sum mentioned being very large.

It is a fact, too, that the United States Steel Corporation have purchased the Aragon mine, and are negotiating for a number of other ore properties, conspicuous among which is the Cleveland-Cliffs, the largest outside interest. It is a fact, too, that negotiations are pending for the acquisition of a number of the largest works not yet mentioned in connection with the scheme.

One of the highest authorities in the Lake Superior ore ranges has recently made a rough computation of the reserves of ore controlled by the United States Steel Corporation. He has reached the conclusion that over 1,000,000,000 tons are available.

Capital Increased.

The authorized capital stock of the United States Steel Corporation has been increased to \$550,000,000 of preferred stock and \$550,000,000 of common stock. The corporation have appropriated and have agreed to issue \$425,000,000 of such preferred stock and \$425,000,000 of such common stock under the contract referred to in the circular of March 2, 1901; and they propose to issue the remainder of such authorized capital stock for future requirements and acquisitions, including the acquisition of the stocks deposited under the latest circular, referring to the American Bridge Company, the Lake Superior Consolidated Iron Ore Company and the Oliver interest in the Oliver Iron Mining Company.

The New Directors.

The directors of the United States Steel Corporation are:

✓ J. Pierpont Morgan,	✓ James H. Reed,
✓ John D. Rockefeller,	✓ Henry C. Frick,
✓ Francis H. Peabody,	✓ Daniel G. Reid,
✓ Henry H. Rogers,	✓ E. C. Converse,
✓ Charles M. Schwab,	✓ Percival Roberts,
✓ Elbert H. Gary,	✓ John D. Rockefeller, Jr.
✓ Robert Bacon,	✓ Alfred Clifford,
✓ Charles Steele,	✓ William E. Dodge,
✓ Marshall Field,	✓ Nathaniel Thayer,
✓ Norman B. Ream,	✓ William Edenborn,
✓ P. A. B. Widener,	✓ Abram S. Hewitt,
✓ William H. Moore,	✓ Clement A. Griscom.

One striking fact in connection with this array of names is that what may be called the iron manufacturing interests are relatively in small number, those interested in outside lines being in the majority.

There are represented in the directorate, firstly, the financial interests of J. P. Morgan & Co., these being J. Pierpont Morgan, Robert Bacon and Charles Steele. The Standard Oil party comprises John D. Rockefeller, his son, John D. Rockefeller, Jr., and Henry H. Rogers. The Federal Steel Company have as representatives Elbert H. Gary, Norman B. Ream, Marshall Field and Nathaniel Taylor.

The Carnegie Steel Company have on the board Charles M. Schwab, H. C. Frick and James H. Reed of the Pittsburgh firm of lawyers, Knox & Reed. Of the people prominently identified with the American Steel & Wire Company there are on the board P. A. B. Widener, Alfred Clifford and William Edenborn.

The Moore interests have as representatives William H. Moore, D. G. Reid and William E. Dodge, the latter being prominently identified with the American Tin Plate Company. E. C. Converse represents the National Tube Company, and Percival Roberts the American Bridge Company. Abram S. Hewitt's name in the list is rather a surprise, since he has been identified with the United States Steel Corporation only through his connection with the American Bridge Company. One of his Trenton plants was a constituent concern. Clement A. Griscom is president of the International Navigation Company and closely identified with the management of the Pennsylvania Railroad.

The Officers.

The following is a list of the officers of the new corporation:

President, Charles M. Schwab.
Treasurer, Arthur F. Luke.
Secretary, Richard Trimble.
Executive Committee: E. H. Gary, chairman; Daniel G. Reid, William Edenborn, E. C. Converse, Percival Roberts and Charles Steele.

Finance Committee: Robert Bacon, chairman; Henry H. Rogers, Norman B. Ream and P. A. B. Widener.

Arthur F. Luke, the treasurer, has been the treasurer of the National Tube Company.

The Talbot Process.—The output of the Talbot continuous furnace at the Pencoyd Iron Works, Pencoyd, Pa., for the week ending March 23, 1901, was 775 gross tons of ingots in 42 heats, with a gain of 6.6 per cent. on the furnace.

Metal Market.

Office of *The Iron Age*, 232-238 William street,
New York, April 3, 1901.

Pig Tin.—At the beginning of the week under review spot Tin reached 26.45c., but it did not hold this figure long. Prices have steadily receded, and at the close to-day values were about 1c. below the high mark of the week, with 25.50c. as the closing figure. There was a sale at that figure. The London market opened on Thursday £116 2s. 6d. for spot and closed to-day £113 15s. for spot and £111 12s. 6d. for futures. A summary of the monthly statistics, which are compiled by the New York Metal Exchange, is printed below. In going over the figures for the first quarter of this year an interesting state of affairs is revealed when the normal statistical portion is taken into consideration. The total visible supply, which during the years 1896 to 1900 decreased from month to month, has shown quite differently during the first quarter of this year. On February 1 of this year an increase of 215 tons was noticed over the previous quarter. On March 1 this increase had reached 263 tons, and on April 1 it reached 501 tons, showing a steady increase. Thus far this year the Straits have shipped about 300 tons per month more than last year, and it is fair to presume with advices from the Straits that further shipments will be at the same ratio. The Banca and Billiton sales this year give us about 100 tons more than last year. This, together with the increased shipments of 300 tons per month, gives an increase for this year of 4800 tons above the shipments of last. Our consumption for the first quarter of this year shows a decrease of 800 tons, and the deliveries in London and Holland show a decrease of 300 tons for the same period, making 1100 tons for the quarter, or at the rate of 4400 tons per year. On this basis it does not seem that the statistical position is of a nature to encourage high prices.

Copper.—An effort is being made by a certain prominent interest to advance prices, but the balance of the trade are holding to their former prices and terms. The effort to stiffen values set agoing considerable talk to the effect that "the producers" had advanced prices $\frac{1}{2}$ c. This is not a fact, as the producers still adhere to the quotations which we have printed for some weeks, viz.: 17c. for Lake and 16 $\frac{1}{2}$ c. for Electrolytic. The only excuse for the talk which we can ascertain is that the producing interest referred to are now demanding cash, whereas they formerly gave 30 days' credit, as is the usual custom in the Copper trade. It is said that the firm who have inaugurated the change were the first to swerve from the old-time method of exacting spot cash payment. By conceding 30 days to the purchaser, they established a new rule which the other producers were forced to follow. Now they have gone back to the spot cash basis. They claim that the demand for home consumption is large. That the demand for export is nothing like large is best shown by the statistics, which show that for the first three months of this year a decrease of 20,621 tons was scored, as compared with the same period of last year. The decrease in shipment to Europe actually commenced in November of last year, and figuring the decrease during the last five months, we find that Europe is taking at the rate of 60,000 tons per year less than last year. The European market has in the meantime commenced to decline again and it closed to-day £68 12s. 6d. for spot, and three months' futures were £69 2s. 6d. Best Selected declined 10 shillings, to £75 5s. The European statistics show that the following interesting changes occurred during the last fortnight of the month of March: Stocks increased, 570 tons; afloat increased 500 tons.

Pig Lead.—Here the market is extremely dull and prices are unchanged. The American Smelting & Refining Company quote 4.37 $\frac{1}{2}$ c. for Desilverized, f.o.b. New York, and 4.32 $\frac{1}{2}$ c., f.o.b. St. Louis. In London the market has declined steadily, reaching the lowest to-day with £12 16s. 3d. for Soft Spanish. This merits no surprise when it is considered that the shipments from this side during the month of March actually amounted to

9349 tons from New York and Philadelphia. The plans of the American Smelting & Refining Company for acquiring the Guggenheim properties received a setback last week in the form of a decision by the Court of Errors and Appeals of the State of New Jersey, reversing the Chancellor's decision, which had previously set aside an injunction restraining the company from issuing stock to take over the Guggenheim plants. The latest order of the court is that "the order of the court below be reversed and the company is enjoined from issuing stock for the purchase of the Guggenheim plant unless it shall appear on final hearing that the stock to be issued does not exceed the value of the property to be acquired." The decision has, however, by no means precluded any possibility of successfully closing the deal. Attorneys and counsel for the two interests have already set to work on evolving plans whereby the court's decision can be circumvented, and it is said in this connection that a new company will be formed to absorb both the American company and the Guggenheim firm. The new company will issue new stock, it is said, in return for that deposited by the two combining interests, in the same manner as the United States Steel Corporation will issue stocks for the certificates of each of the companies they absorb.

Spelter.—Has shown a little firmness and the market is up to 3.92 $\frac{1}{2}$ c. to 3.95c. There is an increased buying for consumption and this is said to have occasioned the rise. Europe has again commenced to decline and closed to-day £16 7s. 6d. Exports from here show very small for this year.

Antimony.—There is no change. Hallett's is quoted 8 $\frac{1}{2}$ c. to 9c., and Hungarian 8 $\frac{1}{2}$ c. to 8 $\frac{3}{4}$ c., and Cookson's nominal 10 $\frac{1}{4}$ c.

Nickel.—The position of the article is unchanged; the prices are still quoted 55c. to 60c. for ton lots.

Quicksilver.—There is no change; prices quoted are \$51 per flask of 76 $\frac{1}{2}$ lbs. for lots of 50 flasks or more. The London market is unchanged at £9 2s. 6d.

Tin Plate.—It is said that a good demand characterizes the market. Prices are unchanged; the American Tin Plate Company quote on a basis of \$4.19 per box of Standard 100-lb. Plates, f.o.b. New York, and \$4, f.o.b. mill. Deliveries at these prices can be had until June 1.

J. H. Jolley & Co., 42 North Fifth street, Philadelphia, Pa., have been appointed selling agents in that territory for Charles S. Trench & Co., New York. A complete line of Pig Tin, Tin Plate and Metals will be carried.

Iron and Industrial Stocks.

The feature in the stock market during the week has been the enormous activity in the United States Steel Corporation, the sales aggregating nearly 1,500,000 shares, one-third of the number being preferred. Monday and Tuesday were banner days. Since then there has been some liquidating to take profits. Reports are current concerning some of the other properties. Thus there is a story afloat that the Tennessee, Sloss-Sheffield and Republic companies are to consolidate. Notable activity has taken place during the last few days in Cambria Steel, which has risen two points to-day. Bethlehem, too, has been rising. The terms offered to the stockholders of the American Bridge Company, being better than expected, have caused a sharp advance in their issues.

	Bid.	Asked.
American Bridge Company, common	50	50 $\frac{1}{4}$
American Bridge Company, preferred	105 $\frac{1}{2}$	106 $\frac{1}{4}$
E. W. Bliss, common	130	..
E. W. Bliss, preferred	125	..
Diamond State Steel	5%	5%
Dominion Iron & Steel Company	39	..
Empire Iron & Steel, common	3	8
Empire Iron & Steel, preferred	39	45
National Enam. & St., common	20	22
National Enam. & St., preferred	81	84
New Haven	4 $\frac{1}{2}$	4 $\frac{1}{2}$
* Otis Elevator, common	28	29
* Otis Elevator, preferred	92 $\frac{1}{4}$	93 $\frac{1}{4}$
Tidewater Steel	6 $\frac{1}{4}$	7
U. S. Cast Iron Pipe Company, common	8	9
U. S. Cast Iron Pipe Company, preferred	39	39 $\frac{1}{4}$

QUOTATIONS OF IRON STOCKS DURING THE WEEK ENDING APRIL 3, 1901.

Cap'l Issued.		Thursday.	Friday.	Saturday.	Monday.	Tuesday.	Wednesday.	Closing quotations.	Sales.
\$29,000,000	Am. Car & Foundry, Com.	26 $\frac{1}{4}$ -27	26 $\frac{1}{4}$ -26 $\frac{1}{2}$	26 $\frac{1}{4}$ -27 $\frac{1}{4}$	27 -27 $\frac{1}{2}$	27 -27 $\frac{1}{2}$	26 -27 $\frac{1}{2}$	26 $\frac{1}{4}$	26,600
29,000,000	Am. Car & F'ndry, Pref.||	79 $\frac{3}{4}$ -80 $\frac{1}{2}$	80 -81	81 $\frac{1}{4}$ -82 $\frac{1}{2}$	82 $\frac{1}{4}$ -82 $\frac{1}{2}$	82 -82 $\frac{1}{2}$	82 $\frac{1}{4}$ -83	82 $\frac{1}{4}$	14,800
24,500,000	Am. Sheet Steel, Com.	43 $\frac{3}{4}$ -44 $\frac{1}{2}$	44 $\frac{1}{2}$ -45 $\frac{1}{2}$	44 $\frac{1}{2}$ -45 $\frac{1}{2}$	46 $\frac{1}{2}$ -47 $\frac{1}{4}$	48 -49	-47 $\frac{1}{2}$	47 $\frac{1}{4}$	2,800
24,500,000	Am. Sheet Steel, Pref.||	94 -94 $\frac{1}{2}$	94 -96	-96 $\frac{1}{2}$	.....	-97 $\frac{1}{2}$	.....	.....	3,100
19,000,000	Am. Steel Hoop, Com.	42 -44 $\frac{1}{4}$	44 -45 $\frac{1}{2}$	45 $\frac{1}{4}$ -46	46 $\frac{1}{2}$ -48 $\frac{1}{2}$	47 $\frac{1}{4}$ -49	47 $\frac{1}{4}$ -48 $\frac{1}{2}$	48 $\frac{1}{4}$	34,900
14,000,000	Am. Steel Hoop, Pref.||	93 -94 $\frac{1}{2}$	94 $\frac{1}{2}$ -96	95 $\frac{1}{4}$ -96	96 $\frac{1}{4}$ -97	95 -97 $\frac{1}{2}$	95 $\frac{1}{4}$ -96 $\frac{1}{2}$	96	9,900
50,000,000	Am. S. & W., Com.	42 $\frac{3}{4}$ -45	44 $\frac{1}{2}$ -46	46 $\frac{1}{2}$ -48 $\frac{1}{2}$	47 -49 $\frac{1}{2}$	48 $\frac{1}{2}$ -49 $\frac{1}{2}$	49 -49 $\frac{1}{2}$	49	33,900
40,000,000	Am. S. & W., Pref.||	107 $\frac{1}{2}$ -110	110 $\frac{1}{2}$ -111 $\frac{1}{2}$	110 $\frac{1}{4}$ -111 $\frac{1}{2}$	112 -112 $\frac{1}{2}$	111 $\frac{1}{2}$ -112 $\frac{1}{2}$	-112 $\frac{1}{2}$	112 $\frac{1}{2}$	5,900
28,000,000	Am. Tin Plate, Com., N.Y.	71 -73 $\frac{1}{2}$	73 $\frac{1}{2}$ -74 $\frac{1}{2}$	-74 $\frac{1}{2}$	75 -78 $\frac{1}{2}$	78 $\frac{1}{2}$ -80	79 -79 $\frac{1}{2}$	79	13,900
18,325,000	Am. Tin Plate, Pref., N.Y.||	116 $\frac{1}{4}$ -117 $\frac{1}{2}$	.....	-118 $\frac{1}{2}$	120 -121	119 $\frac{1}{4}$ -120	-120	120	5,100
7,500,000	Bethlehem Iron	.....	-62	.....	.....	-61 $\frac{1}{2}$	.....	.....	216
15,000,000	Bethlehem Steel\ddagger	.....	-18	-18	17 $\frac{1}{4}$ -18	18 -18 $\frac{1}{2}$	18 -19 $\frac{1}{2}$	18 -19 $\frac{1}{2}$	4,379
7,974,550	Cambria Iron, Phila.*	.....	-48	.....	.....	-45 $\frac{1}{2}$	-45 $\frac{1}{2}$	-45 $\frac{1}{2}$	1,848
16,000,000	Cambria Steel**	16 -16 $\frac{1}{2}$	16 $\frac{1}{2}$ -16 $\frac{3}{4}$	.....	-16 $\frac{1}{2}$	16 $\frac{1}{2}$ -16 $\frac{3}{4}$	17 -17 $\frac{1}{2}$	17 $\frac{1}{2}$ -19 $\frac{1}{2}$	31,950
11,000,000	Colorado Fuel & Iron	54 $\frac{1}{4}$ -56 $\frac{1}{2}$	54 $\frac{1}{4}$ -55 $\frac{1}{2}$	55 $\frac{1}{4}$ -55 $\frac{1}{2}$	55 $\frac{1}{4}$ -58	58 $\frac{1}{4}$ -65	63 $\frac{1}{4}$ -65 $\frac{1}{2}$	64 $\frac{1}{4}$	86,600
24,410,900	Crucible Steel, Com.	.....	.....	.....	-27	.....	-26	26	600
24,399,500	Crucible Steel, Pref.	.....	.....	.....	.....	.....	.....	.....	.....
46,484,500	Federal Steel, Com.	48 $\frac{1}{2}$ -50 $\frac{1}{2}$	50 $\frac{1}{2}$ -51 $\frac{1}{2}$	52 -52 $\frac{1}{2}$	52 $\frac{1}{2}$ -55 $\frac{1}{2}$	55 -55 $\frac{1}{2}$	55 $\frac{1}{2}$ -55 $\frac{1}{2}$	55 $\frac{1}{2}$	42,600
53,253,500	Federal Steel, Pref. \ddagger	101 $\frac{1}{4}$ -104 $\frac{1}{2}$	103 $\frac{1}{4}$ -104 $\frac{1}{2}$	104 -104 $\frac{1}{2}$	104 $\frac{1}{2}$ -105 $\frac{1}{2}$	104 $\frac{1}{2}$ -105	105 $\frac{1}{4}$ -105 $\frac{1}{2}$	105 $\frac{1}{4}$	12,400
15,000,000	International Pump, Com.	32 -32 $\frac{1}{2}$	31 $\frac{1}{4}$ -32	.....	33 -34 $\frac{1}{2}$	34 -35	34 $\frac{1}{4}$ -35	35	9,800
12,500,000	International Pump, Pref.	.....	82 -83	.....	.....	84	.....	.....	900
11,000,000	International Silver	6 $\frac{1}{2}$ -6 $\frac{1}{2}$	6 $\frac{1}{2}$ -7	7 -7 $\frac{1}{2}$	7 $\frac{1}{4}$ -7 $\frac{1}{2}$	7 -7 $\frac{1}{2}$	7 -7 $\frac{1}{2}$	7 $\frac{1}{2}$	3,900
32,000,000	National Steel, Com., N.Y.	53 -54 $\frac{1}{2}$	54 $\frac{1}{2}$ -56 $\frac{1}{2}$	57 -58 $\frac{1}{2}$	57 $\frac{1}{2}$ -59 $\frac{1}{2}$	59 $\frac{1}{4}$ -60 $\frac{1}{2}$	59 $\frac{1}{4}$ -60 $\frac{1}{2}$	59 $\frac{1}{4}$	14,600
27,000,000	Nat. Steel, Pref., N.Y.||	115 -116	116 $\frac{1}{2}$ -117	117 $\frac{1}{4}$ -118 $\frac{1}{2}$	119 $\frac{1}{4}$ -119 $\frac{1}{2}$	119 -120	119 -119 $\frac{1}{2}$	119	5,900
40,000,000	National Tube, Com., N.Y.	60 $\frac{1}{2}$ -62 $\frac{1}{2}$	62 $\frac{1}{2}$ -64	60 $\frac{1}{2}$ -64 $\frac{1}{2}$	65 -67 $\frac{1}{2}$	67 $\frac{1}{2}$ -69	68 -68 $\frac{1}{2}$	68 $\frac{1}{2}$	17,800
40,000,000	Nat. Tube, Pref., N.Y.||	114 $\frac{1}{2}$ -115	.....	.....	118 $\frac{1}{2}$ -118 $\frac{1}{2}$	118 $\frac{1}{2}$ -120	120 $\frac{1}{2}$ -121	120 $\frac{1}{2}$	3,382
5,000,000	Penna., Com., Phila.	.....	.....	.....	.....	.....	.....	.....	.....
1,500,000	Penna., Pref., Phila.	.....	.....	.....	.....	.....	.....	.....	.....
12,500,000	Pressed Steel, Com.	37 $\frac{1}{4}$ -37 $\frac{1}{2}$	37 $\frac{1}{2}$ -38	38 -39 $\frac{1}{2}$	39 $\frac{1}{4}$ -40 $\frac{1}{2}$	39 -39 $\frac{1}{2}$	39 $\frac{1}{4}$ -39 $\frac{1}{2}$	39 $\frac{1}{4}$	9,700
12,500,000	Pressed Steel, Pref.||	79 $\frac{1}{2}$ -80 $\frac{1}{2}$	80 -82	81 $\frac{1}{4}$ -83	82 $\frac{1}{4}$ -82 $\frac{1}{2}$	80 $\frac{1}{4}$ -81 $\frac{1}{2}$	80 $\frac{1}{4}$ -81 $\frac{1}{2}$	80 $\frac{1}{4}$	17,600
27,191,000	Repub. Iron & Steel, Com.	17 $\frac{1}{2}$ -17 $\frac{1}{2}$	17 $\frac{1}{2}$ -18 $\frac{1}{2}$	18 $\frac{1}{2}$ -19 $\frac{1}{2}$	19 $\frac{1}{2}$ -22 $\frac{1}{2}$	21 $\frac{1}{2}$ -22 $\frac{1}{2}$	20 -21 $\frac{1}{2}$	20 $\frac{1}{2}$	80,800
20,306,900	Repub. Iron & Steel, Pref.||	69 $\frac{1}{2}$ -71 $\frac{1}{2}$	71 $\frac{1}{2}$ -74	73 $\frac{1}{2}$ -75 $\frac{1}{2}$	75 $\frac{1}{2}$ -82	74 $\frac{1}{2}$ -80 $\frac{1}{2}$	77 -78	77 $\frac{1}{2}$	36,000
7,500,000	Sloss-Sheffield S. & I., Com.	33 -34 $\frac{1}{2}$	34 $\frac{1}{2}$ -35	36 -37	38 -40 $\frac{1}{2}$	39 -41 $\frac{1}{2}$	38 -41	38	8,100
6,700,000	Sloss-Sheffield S. & I., Pref.||	76 -78 $\frac{1}{2}$	79 -79 $\frac{1}{2}$	79 $\frac{1}{2}$ -80 $\frac{1}{2}$	82 -84	84 $\frac{1}{2}$ -86	84	84	1,600
20,000,000	Tennessee Coal & Iron	57 $\frac{1}{2}$ -57 $\frac{1}{2}$	57 $\frac{1}{2}$ -58 $\frac{1}{2}$	58 $\frac{1}{2}$ -62 $\frac{1}{2}$	63 -66 $\frac{1}{2}$	64 -66	64 $\frac{1}{2}$ -66	64 $\frac{1}{2}$	71,500
1,500,000	Warwick I. & S. (par \$10)	-7	.....	.....	.....	.....	.....	.....	125
10,000,000	Am. Bicycle Co., Com.	.....	-6 $\frac{1}{2}$	-6 $\frac{1}{2}$	6 $\frac{1}{2}$ -6 $\frac{1}{2}$	-6 $\frac{1}{2}$	6 $\frac{1}{2}$	.....	1,300
20,000,000	Am. Bicycle Co., Pref.	.....	.....	.....	.....	.....	.....	.....	.....
	Am. Bicycle Co., Bonds	79 $\frac{1}{2}$ -80	80 $\frac{1}{2}$ -81	.....	.....	-80	.....	.....	6,600
U. S. Steel Co., Com.||	42 $\frac{1}{2}$ -45	44 $\frac{1}{2}$ -46	46 -46 $\frac{1}{2}$	46 $\frac{1}{2}$ -49	48 $\frac{1}{2}$ -49 $\frac{1}{2}$	48 $\frac{1}{2}$ -49 $\frac{1}{2}$	48 $\frac{1}{2}$ -49 $\frac{1}{2}$	48 $\frac{1}{2}$	914,600
U. S. Steel Co., Pref.||	92 $\frac{1}{2}$ -95	94 $\frac{1}{2}$ -96	95 $\frac{1}{2}$ -96 $\frac{1}{2}$	95 $\frac{1}{2}$ -97	95 $\frac{1}{2}$ -97 $\frac{1}{2}$	96 -96 $\frac{1}{2}$	96 -96 $\frac{1}{2}$	96 $\frac{1}{2}$	542,500

§ 7 1/2 Non-Cu. | 7 1/2 Cu. | +6% Non-Cu. | + Par \$50, \$1 paid in. | Authorized Capital \$550,000,000 Common; \$555,000,000 Preferred; \$304,000,000 bonds. * Par \$50. ** \$10.50 per share paid in. + 6% guaranteed by Bethlehem Steel Co. Late Philadelphia sales by telegraph. + Ex-dividend. §§ With interest.

Bonded Indebtedness: Am. S. & W., \$130,656; Am. Tin Plate, none; Am. Steel Hoop, none; Cambria Iron Co., \$2,000,000 6% debenture 20-year bonds, 1917, payable option 5 years, assumed by Cambria Steel Co.; Federal Steel Co., \$9,822,000 Illinois 5%, \$7,417,000 E. J. E. R. R. 5%, \$1,600,000 Johnson 6%, \$6,732,000 D & I. R. R. 5%, \$1,000,000 2d D. & I. R. R. 6%, \$10,000 land grant D. & I. R. R. 5%; National Steel, \$2,561,000 6%; National Tube, none; Tennessee C. I. & R. R. Co., \$8,367,000 6%, \$1,114,000 7%, \$1,000,000 7% cu. pref.; Pennsylvania Steel, \$1,000,000 5%; Steelton 1st, 1917. \$2,000,000 5%; Sparrow's Point, 1st, 1922, \$4,000,000, consolidated, both plants; Bethlehem Iron, \$1,281,000 5% maturing 1907. Interest and principal guaranteed by Bethlehem Steel Co. Republic Iron & Steel, none; Warwick Iron & Steel, none; Colorado Fuel & Iron Co.; Col. Fuel Co. Gen. Mort. 6% \$880,000, Col. Coal & Iron Con. Mort. 6% \$2,810,000, Col. Fuel & Iron Gen. Mort. 5% \$2,303,000. Also outstanding \$2,000,000 preferred stock on which dividends have been paid to June 30, 1900. Sloss-Sheffield St. & I. Co., Sloss I. & S. first mortgage 6%, \$2,000,000, Sloss I. & S. general mortgage 4% \$1,835,000.

U. S. Projectile.....	110	
Va. C. I. & C., stock.....	3½	4½
Va. C. I. & C., bonds.....	40	
H. R. Worthington, preferred.....	110	
American Tin Can, common.....	29¾	29¾
American Tin Can, preferred.....	77½	78

International Silver Company.—At the annual meeting of the International Silver Company the following balance sheet as of December 31, 1900, was presented: "Assets—Plants, investment, &c., \$16,282,100; stock on hand, manufactured, in process and raw, \$2,982,431; other investments, \$224,295; first mortgage bonds in treasury, \$115,000; cash, \$434,910; accounts receivable, \$1,936,145; total, \$22,009,881. Liabilities—Capital stock preferred, \$5,105,500; common stock, \$9,944,700; first mortgage bonds, \$3,900,000; first mortgage bonds of Holmes & Edwards Silver Company, \$127,600; accounts payable, \$1,251,698; surplus, \$1,678,383; total, \$22,009,881. The old Board of Directors was re-elected. There are only 16 directors instead of 17. This is caused by the resignation of Mr. Watrous."

The Sharon Steel Company, Sharon, Pa., have increased their capital stock from \$4,000,000 to \$5,000,000. This makes the third or fourth time that the capital stock of this concern has been increased.

At a meeting of the Board of Directors of the Westinghouse Electric & Mfg. Company of Pittsburgh, held in New York last week, the following resolution was adopted: "That the transfer books of the company be closed April 9, 1901, at 3 p.m., for subscriptions to new stock and opened on April 20, 1901, at 10 a.m." The stockholders at a recent special meeting authorized an increase of stock by \$10,000,000—from \$15,000,000 to \$25,000,000—the new stock to have the same rights and privileges as the present "assenting stock." They also author-

ized the directors to sell the new stock at not less than par. The directors have authorized the sale of \$3,000,000 of the stock at \$55 for each \$50 share, to be offered to the stockholders at the rate of one share for every five shares of stock now held. Stockholders of record at the closing of the transfer books on April 9 are offered the privilege of subscribing.

Dividends.—The directors of the Union Switch & Signal Company have declared the usual quarterly dividends of 1 per cent. on the common and 2 per cent. on the preferred stock.

The Executive Committee of the Tennessee Coal, Iron & Railroad Company have declared the regular quarterly dividend of 2 per cent. on their outstanding preferred stock, payable May 1. Books close April 9 and reopen May 2.

The Penn-American Glass Company, Incorporated, Pittsburgh, have declared a quarterly dividend of 1 1/4 per cent. on the stock, payable April 15.

The Westinghouse Machine Company of Pittsburgh have declared the regular quarterly dividends of 1½ per cent. on the common and preferred stocks, payable April 10.

The Allegheny Coal & Coke Company of Pittsburgh will apply for a charter April 17. This is an identified interest of the Allegheny Steel & Iron Company, which concern are erecting large sheet mills at Tarentum, Pa.

The Westinghouse Electric & Mfg. Company of Pittsburgh have secured a large order for electrical equipment for a new trolley line to run from Wellsburg to Wheeling, W. Va.

The New York Machinery Market.

Office of *The Iron Age*, 223-228 William street, New York. April 3 1901.

Machinery manufacturers are somewhat puzzled over the present state of business. The most perplexing feature of the situation is that, while inquiries are keeping up beautifully, orders are comparatively scarce. Every day brings forth a new batch of inquiries which look to be forerunners of immediate business of good volume, but, after they have been responded to by the merchants, for some unexplainable reason the matter is allowed to rest. It seems to be impossible to get the interested parties to close the transaction. It is argued that this cannot be due to present prices, for they are comparatively low, and even in the few instances where the purchases are actually made the terms agreed upon are generally considerably in favor of the purchaser. Concessions are not an unheard of quantity.

One of the most interesting items of the week in the machine tool trade was the rumor that the contract for the entire machinery equipment for the new Elizabethport shops of the Central Railroad of New Jersey had been awarded to Manning, Maxwell & Moore. At the office of the latter concern it was stated that the signed order had not been received as yet, and consequently nothing could be said.

It is hinted in the trade that something big may soon be expected from the Singer Mfg. Company of Elizabethport, N. J. It is said that they intend occupying the buildings which are being vacated by the Babcock & Wilcox Company and which adjoin the Singer plant. In addition they will erect another large building. The cause for this expansion, it is said, is an extensive increase proposed in the electric motor department of the works. No confirmation or denial is to be had from the officers of the company. We are also informed that this concern are receiving shipments of machine tools at Elizabethport and they are received boxed for export. The report has it that these machines are to be reshipped to Russia, where they will be used in equipping the branch plant which is now being built.

The sale of the Rogers Locomotive Works to parties who are endeavoring to form a syndicate to put them in shape and operate them is good news not only to the citizens of Paterson, N. J., but to the machinery trade as well. If the present plans are successful the old shops will be fitted out with a large complement of machine tools. It is expected that the plans of the purchasers will have matured within the next month or two. Foreign capital is to be interested in the proposed company who are to operate the works.

Proposals will be received at the Bureau of Supplies and Accounts, Navy Department, Washington, D. C., until April 16 for a quantity of machine tools and electric motors, together with carborundum wheels, piping and fittings, sheet steel, chain, &c. The materials are to be furnished to the Mare Island, Cal., Navy Yard.

Proposals will be received at the Bureau of Equipment, Navy Department, Washington, D. C., until May 14 for a coaling plant to be erected at the Narragansett Bay coal depot, Portsmouth Grove, R. I.

In addition to other changes which are contemplated at the Newport News shipyards, it is said that another overhead cantilever crane will be erected. There are three of these cranes in operation at present, each one overhanging two ships. They were built by the Brown Hoisting Machinery Company of Cleveland, Ohio.

It is reported that the Midvale Steel Works of Nicetown, Philadelphia, are preparing plans for the erection of two new machine shops, which are to be 85 x 416 and 324 x 164 feet respectively. It is also said that heavy electric traveling cranes are to be installed.

There is an inquiry going the rounds for a number of small tools which are to be installed in a new factory to be built by the Penn's Optical Works, Reading, Pa. It is stated that W. W. Essick is the proprietor of the works and W. H. Finck of Reading, Pa., the architect.

An extension will be built to the plant of W. H. Rankin & Co., Elizabethport, N. J., and in addition a 500 horse-power Corliss engine, boilers, condensers, feed

water heaters and pumps will be installed. The company manufacture roofing paper.

A large addition is being built to the plant of the Ball & Wood Company, engine builders, of Elizabethport, N. J. Increased boiler capacity will be required, as well as a large equipment of machine tools. It is said that the new addition will be employed principally on the heavier types of engines.

The Tractor Company, Incorporated, have just leased the plant of the Yates Carpet Works, Elizabethport, N. J., and are installing a small machine shop, where experimental work will be done with a new type of steam automobile. When the experimenting has terminated the company intend erecting a very extensive plant on this site. William E. Gibbs is the chief engineer.

An addition is to be built to the refrigerating plant of Lyon & Sons Brewing Company of Newark, N. J. The new building is to be 25 x 38 feet and two stories in height. The plant is located on South Canal street.

The Fuel Economizer Company of 74 Cortlandt street have closed a contract with the Pioneer Iron Company of Marquette, Mich., for a 4000 horse-power economizer plant, which will be installed in connection with the new blast furnace plant which the company are erecting. The boilers have been purchased from the Sterling Company and induced draft apparatus was purchased from the B. F. Sturtevant Company of Jamaica Plain, Boston.

August Goertz & Co. of Morris avenue, near South Orange avenue, Newark, N. J., are about to place orders for an extension to their plant. The plant is employed in the manufacture of metal novelties. Besides two 150 horse-power boilers, engines, pumps, &c., there will be a quantity of grinding and polishing machinery, drop hammers, presses, &c.

The American Circular Loom Company of Chelsea, Mass., have given a contract to the Forter-Miller Engineering Company of Pittsburgh for the erection of a large factory at New Orange, N. J. Although the present plant is to be removed from Chelsea to the new location, a large amount of new machinery will be required.

The Standard Sanitary Mfg. Company of New York City propose erecting a large new factory at Bay-Way, Elizabethport, N. J. It will be equipped with modern machinery and the latest appliances for the manufacture of plumbing specialties.

A large new plant will be erected at Elizabethport, N. J., by the Watson Water Tube Boiler Company, who were recently incorporated in the State of New Jersey with a capitalization of \$250,000. Egbert P. Watson is the president of the company.

At the local offices of the Bullock Electric Mfg. Company of Cincinnati, Ohio, it is announced that an extension of considerable size is to be added to the main machine shop and a large addition is also to be built to the foundry building. An order has already been placed with the Case Mfg. Company of Columbus, Ohio, for a 30-ton electric crane, which is to traverse the new machine shop. The machine tools which will be installed will all be driven by electric motors, which the company will, of course, build themselves.

Inquiries are being made by the Lester Piano Company of Lester, Delaware County, Pa., for an engine, boilers and electrical machinery which are to be installed in a new plant the company intend building.

The Export Business.

Export business remains exceedingly dull as far as Germany and almost all of Continental Europe are concerned. Orders are coming in very sparingly and even those that do go through are of very small account. A party who, like a number of his tradesmen, journeyed all the way from England to get a line on the progress of the British Westinghouse transaction, stated last week that he was satisfied that the awards for the equipment of the new Manchester plant would not be made in this country. He said that the plans now were to lay the whole matter in the hands of the directors at the London office of the company and place the orders from that point. He has returned to England.

An interesting rumor obtained considerable headway on the street, but its authenticity was denied by parties

interested. It was to the effect that Buck & Hickmann of London had placed a rush order for a nice lot of Pratt & Whitney and Brown & Sharpe machine tools. The machines, it was said, are for a large gun factory to be built at St. Petersburg by the Russian Government.

There is a good deal of work in sight in the South American countries, Mexico and Cuba. Some good contracts have already been placed and machinery merchants in general are turning their attention to these countries.

In connection with the equipment for the Chaparro Sugar Company, regarding which an item was published in this column last week, we are informed that the contract for the engines has been awarded to the Birmingham Machine & Foundry Company of Birmingham, Ala. There are to be seven Corliss engines, which will be utilized for driving the large mills.

Thayer & Co., Incorporated, whose local offices are located at 39 Cortlandt street, report that they have been awarded the contract for a 500 horse-power boiler plant which is to be installed in the Municipal Water Works at Shanghai.

S. Oshima, who is director-general of the Imperial Steel Works of Japan, and who was in this city until a few days ago, placed an order with the Chicago Pneumatic Tool Company for 79 pneumatic tools, which are to be used at the Japanese steel works. The order includes hammers, drills, chipping, calking and riveting tools. Mr. Oshima is working his way West and intends sailing from Vancouver, B. C., for Japan.

A contract has been awarded to the Harrisburg Foundry & Machine Company of Harrisburg, Pa., and 203 Broadway, New York, for a 200 horse-power engine to be operated in connection with the Yubari coal mines, which are located near Yokohama, Japan. Mitsui & Co., the local exporting house, placed the order.

Westinghouse, Church, Kerr & Co. have booked an order for a power plant, which will be installed at Lima, Peru, for lighting the city. At present there is in operation a hydraulic plant, but it cannot be relied upon, and hence the auxiliary steam plant. In addition to the engine, which will be furnished by the Westinghouse Machine Company, there will be a 200 horse-power Babcock & Wilcox boiler, Dean pumps and Worthington condensers.

Westinghouse, Church, Kerr & Co. have also received the order for the three engines to be used in connection with the new plant of the National Iron & Steel Company of Mexico City. The order includes a 280 horse-power, a 125 horse-power and a 50 horse-power gas engine. The gas producing machinery will be furnished by the Loomis-Pettibone Company of New York.

An order has been received by the Ames Iron Works of Oswego, N. Y., for a 400 horse-power slide valve engine, which will be installed in connection with the new power plant to be erected at Guaymas, State of Sonora, Mexico. They will also furnish horizontal tubular boilers, and the pumps will be furnished by the International Steam Pump Company. Feed water heaters have been purchased from Kelley & Sons.

An inquiry has been received from parties in Mexico by A. W. Colwell & Son of 39 Cortlandt street for the construction and equipment of a sugar refinery which is to have a capacity of 25 tons of refined sugar per day.

The Harrisburg Foundry & Machine Company received an order from the Compania Fundidora de Ferro y Acero, a large smelting company of Monterrey, Mexico, for two high speed automatic engines, which are to be direct connected to General Electric generators.

There are a number of visitors in this city from Mexico, South America, Cuba and Australia, who will probably effect a number of purchases before they return. F. L. Torres, who is stopping at the Astor House, is said to be a large coffee planter and rubber grower in Mexico. Ricardo S. Porro, a large contractor, having headquarters in Santiago de Cuba, is said to be negotiating for the purchase of contractors' tools. He is at the Hotel Imperial. Richard M. Flatow and Ernst Wiener,

who represent the German firm of Arthur Koppel, are in this country. It is expected that they will be in New York before the end of this week, and can be found at the local offices of the company, 68 Broad street. Mr. Flatow is in charge of the South African branch of the firm, and it is reported that he will purchase machinery for the equipment of an extension to the factory in Johannesburg. Arthur Lyon, who is stopping at the Fifth Avenue Hotel, it is said, is interested in industrial enterprises in Costa Rica, and may purchase some machinery.

E. W. Bliss Company of Brooklyn, N. Y., manufacturers of presses, dies and special machinery, have opened a branch office at 15 Viale Montford, Milan, Italy.

The American Bridge Company in Utah.

The Denver papers report that the American Bridge Company have canceled an option on 10 acres of ground secured last September because of the passage of the employers' liability bill by both branches of the Colorado Legislature. It was the intention of the company to make Denver the headquarters of the entire Rocky Mountain and Pacific Coast country, but they will now establish these headquarters at Salt Lake. The company are said to be sending from 100 to 200 carloads of bridges each month through Denver. They proposed to build fitting shops at Denver, so that the material might be shipped to that city from their manufacturing plants throughout the East. The company have forfeited \$2000 by the cancellation of the option, but the Salt Lake City merchants have raised a sum sufficient to reimburse them for that amount and to purchase a piece of ground which will be deeded to the company as a bonus for locating in that city. Further than this, the Salt Lake people guarantee to protect the company against vicious legislation.

Molders' Wages Remain Unchanged.

The result of the conference between the Stove Founders' Defense Association and the representatives of the Iron Molders' Union of North America, held in Chicago last week, was awaited with considerable concern by the trade. The molders naturally desire to get as high payment as possible for their work, while, on the other hand, the stove makers, if they are to secure a profit, must keep down this important item of cost. It is a gratifying fact, therefore, that the result of the harmonious conference on Wednesday was the establishment of the same scale of wages as last year. This removes one of the most uncertain factors in the trade, and the stove men can plan out for the coming 12 months knowing how much the labor cost will be. If a conference might be held between the stove foundrymen and the pig iron producers so as to establish a fixed price for pig iron, once every 12 months, it would do much to relieve anxiety. The iron market, however, will probably in the future, as in the past, continue to be a changeable and uncertain thing, which will sometimes go clean contrary to the forecast of the most astute guesser.

The Pennsylvania Railroad have just awarded to the American Bridge Company a contract to furnish the steel for the superstructure of the train shed to be erected east of the new Union Station in Pittsburgh. The shed will be 570 feet long and 258 feet wide. The roof will consist of one arched span, about 60 feet above the ground in the middle. About 2200 tons of structural steel will be required, which is to be delivered within 60 days from the date of contract. This material will be furnished by the Carnegie Steel Company, Pittsburgh. The new shed will have room for 14 tracks, with three tracks at each side on the outside, making 20 tracks in all. The old shed, which was torn down about a year ago, had room for only eight tracks. Most of the foundations for the new train shed are already laid.

The Chicago Machinery Market.

Office of *The Iron Age*, 1205 Fisher Building, Chicago, April 1, 1901.

Engines.

The demand for large engines is increasing. Leading manufacturers are far behind on orders, and plants that have hitherto given most of their time to the manufacture of small engines are being re-equipped and will turn out large ones. Inquiries are about equally divided between small and medium sized engines, and while some report the demand for large and small ones about equal, the majority concur in the fact that more large engines are being sold, and more will be sold. Second hand engines are hard to find, and invariably prospective buyers are kept waiting until the dealer can procure them.

Gas Engines.

The condition of trade in gas and gasoline engines is similar to that in steam engines. The demand is improving rapidly, and the reason assigned is that it is beginning to be generally recognized that for many purposes important advantages and economies are secured by their use.

Machine Tools.

The general trade in machine tools is becoming more brisk. The orders and inquiries for single tools, both small and large, are increasing. The demand for general machine shop equipment is better. Railroads have closed some important contracts for both railroad tools and machine shop outfits. Agricultural machine tools are suffering a relapse, and their demand is only fair. Some new plants requiring machine tools and equipments are to be built soon, but they are not yet in the market. The amount of business done the last three months does not exceed that done in the first quarter of 1900, and perhaps may not equal it, as business was then very active in machine tools. Prices are being cut in some lines, especially on milling machines, which are in plentiful supply. Buyers find, in fact, that with the exception of heavy tools, they can get anything they need either from stock or promptly from the factory. The future is a little clouded by the prospect of a strike among the machinists. It is hoped that the trouble may be amicably settled, so that trade will not be seriously interfered with.

Elevating, Conveying and Power Transmitting Machinery.

The manufacturers of this class of machinery report trade fair. Inquiries are numerous, but few large deals have been closed. None of the plants are being over-worked. Judging by present inquiries, the next few months should develop a large number of good sized orders.

Belting.

The large belt manufacturers report a slow but steady increase in their general lines. Inquiries are numerous, but the orders that are being closed call for medium sized lots. The business done the last month seems to have been in excess of that done in March, 1900. The general trade in belting is better than that in the machinery line.

Foundry Trade.

Jobbing foundries are fairly busy, but none are doing the amount of work expected at this time. Considerable dissatisfaction is expressed over a contract recently captured by a large company operating foundries mainly on work for other departments of their own business. The castings were taken at a price which is said to simply cover cost, for the purposes of keeping the company's foundries supplied with a large volume of work. The contract called for 8000 tons. When the company closed the deal the contract was so divided that only 800 tons are to be made in Chicago, and the rest scattered in different cities. How far reaching such deals are cannot be told now, but local foundrymen are greatly disturbed over what they regard as an encroachment on their trade.

Hill, Clarke & Co., 12 and 14 South Canal street, Chicago, have closed a contract for a complete machine

shop equipment for the Illinois Steel Company, Chicago, and another for the Metallurgical Company, Torreon, Mo. These two deals are among the largest recently placed with the firm in Chicago. They have also closed a contract with the Chicago, Burlington & Quincy Railroad Company to supply them with machine tools.

The Winslow Elevator & Machine Company, 96 to 100 North Clinton street, Chicago, have just installed two large boring mills, two medium sized punching machines and a large cold saw. The company are in need of more space, and arrangements are being made to enlarge the plant.

The Wisconsin Foundry & Steel Company, a new corporation who will manufacture steel ranges at Cedar Grove, Wis., have just bought a foundry outfit from the S. Obermayer Company, Chicago, and two large boilers, a Corliss engine and a machine shop equipment from the J. H. Dawson Machinery Company, Chicago.

The Steel Ball Company, manufacturers of steel balls, Austin and Claremont avenues, Chicago, suffered slight damage by a fire which occurred March 23. The loss was covered by insurance. The company have commenced to reft their shop, and will install several of their own patented large forging, rough grinding and finishing machines, and will soon be enabled to turn out an increased product of balls from $\frac{1}{8}$ to 4 inches.

A fire, which occurred Saturday, March 23, destroyed the entire roof and second story of the building at Oakley and Austin avenues, Chicago, owned and occupied by the Kurtz Foundry Company. The damage, which was fully covered by insurance, did not exceed \$5000. The firm will rebuild as soon as possible, and that orders might not be turned away, space has been rented in other foundries, and a force of molders put to work.

The Moloney-Bennett Belting Company, 34 South Canal street, Chicago, have just shipped 6000 feet of belting to Manila. They have also received orders to supply saw mills at Duqueen and Cominto, Ark., and Loring, La.

Henry E. Pridmore, Nineteenth and Rockwell streets, Chicago, suffered the loss of a core oven and 1000 cores by a fire which occurred Saturday, March 23. The damage was fully covered by insurance, and the plant will not be closed for repairs. Mr. Pridmore reports that his European trade has fallen off considerably, especially that of Germany. He is completing a large order for soil pipe molding machines for a Chicago firm, and has closed several contracts for molding machines for radiator manufacturers, a line of trade which has heretofore been very light with him. The trade from the Central States, especially Ohio, is very good. He is now perfecting a new soil pipe molding machine and a copying press, and plans are being considered for an addition to the factory, where these new products will be made.

Among recently licensed incorporations in Illinois is the J. H. Dawson Machinery Company, with a capital of \$35,000, to manufacture and deal in iron and brass working machinery. This company will be the successor to John H. Dawson, Washington and Canal streets, Chicago, who recently bought the interest of Mr. Goodwin of Dawson & Goodwin.

The Otto Gas Engine Works, 360 Dearborn street, Chicago, are now devoting more time and space to the manufacture of large engines than to small and medium sized ones. Their German plant is now making 1000 horse-power gas engines.

The Camp Engineering Company, 18 and 20 South Canal street, Chicago, dealers in new and second hand engines and boilers, report that they received a larger number of inquiries, but made fewer sales in March of the present year than they did in March, 1900. Besides the regular trade in the Central West, they have recently shipped a complete power plant to South America, and have made several shipments of power plant supplies to Alaska.

Rainier & Williams, 63 South Canal street, Chicago, dealers in new and second hand boilers, engines and pumps, have just shipped a 1,000,000-gallon pump to Baltimore, Md.; three large boilers to Joliet, Ill.; a 150 horse-

power engine to Michigan, and a large boiler to Indiana. They have received a number of triplex power pumps with a capacity of 400,000 gallons per day.

The Macomber & Whyte Rope Company, 19 and 21 South Canal street, Chicago, have closed a large deal for a cable way which is to go to Porto Rico. This is believed to be the largest order of its kind recently secured in Chicago.

Fayerweather & Ladew, manufacturers of belting, Chicago, will remove from 68 and 70 South Canal street to 135 East Lake street.

The down town office of the Whitman & Barnes Mfg. Company, Chicago, will be removed May 1 from 71 South Canal street to 66 South Canal street. The company's warehouse is to be enlarged, and a full line of belting and rubber goods will be carried.

The Dodge Mfg. Company, Mishawaka, Ind., and Chicago, have been awarded the contract for furnishing all the power transmitting machinery, hangers and nearly 5000 feet of shafting for the new plant which the Singer Mfg. Company will erect at South Bend, Ind.

The Cincinnati Machinery Market.

Office of *The Iron Age*, Pickering Building, Cincinnati, Ohio, March 25, 1901.

In a general way it may be said of the iron working business in Cincinnati that it is in excellent shape. March business in the machine tool shops has been, on the whole, fairly satisfactory. It is believed that foreign orders, while they are still scarce, are showing up a little bit more frequently than they have averaged for the year past. At this time there are more new contracts in sight in this vicinity than for quite a little time past, and several shops are calling for new equipment and a few entirely new enterprises are in the field.

One of the most important improvements contemplated or in process in this vicinity is that at the Block & Pollak plant, at Steelton, this county. The improvements first consist of a general overhauling of the entire plant, which, by the way, has been in progress for a number of months. Among the improvements already put in is a pneumatic equipment, and also a very large increase in the number of hammers. They are now preparing to erect three buildings. One of them, to be occupied as a machine shop in addition to the one already in operation, will be 90 x 135 feet in size, brick and iron construction. The new boiler room will be 50 x 72 feet, also one-story brick, and the new engine house will be 60 feet square, of uniform construction with the boiler house. The machine shop will be thoroughly equipped with an outfit of heavy lathes, planers and other like machine tools for use in their business of manufacturing car axles. A portion of the equipment has already been contracted for, but it is believed that they are still in the field for several lathes and a planer, also the shafting and other like equipment. They have recently added a 42 x 42 planer, with a 16-foot bed; also a 50-foot 53-inch swing lathe. The boiler room will be equipped with two 150 horse-power water tube boilers, and a new 200 horse-power engine is to be added. It is also the intention to equip the entire plant with electric traveling cranes. When the improvements are all finished, which will be within the next six months, the capacity of the forges will be increased probably one-third, while the capacity in the machine shop will be trebled. The whole new equipment is representing quite a sum of money.

One of the most recent enterprises to enter the field of competition in this territory is the Edwards Railroad Electric Light Company. The movement is the outgrowth of a series of experiments which have been carried on in this city for the past year or so by Edgar A. Edwards, who now figures as president of the new company. S. O. Bayless is vice-president, W. E. Cole secretary and treasurer, both of Cincinnati; C. W. Adams of Chicago is put down as the manager, and the four mentioned, with Dr. S. B. Wise of Millersburg, Ohio, and Charles L. Doughty of Cincinnati, constitute the directory. As the style of the new company indicates, they are to manufacture locomotive headlights and

other lights for railroad trains. The offices of the concern are now located on the eighth floor of the Neave Building in this city, and temporary shop quarters have been established in the building on the southeast corner of Sixth and Baymiller streets, which building was vacated some time ago by the Watkins Laundry Machine Company. The company have purchased a tract of land in Northside, in the neighborhood of where the Haven Malleable Castings Company have recently built their plant, and are now preparing to erect a building 75 x 350 feet, two stories in height. It is to be built of brick. It is understood that they are in the market for all kinds of shop equipment, and will require a number of medium to light machine tools. They will also need an outfit of sheet metal working tools, to say nothing of the belting, shafting and other shop accessories too numerous to specify.

Another important contract, which is being offered to the public for competition, is for a set of boilers and engines for one of the sub-stations in Cincinnati of the new Cincinnati water works. The engines which are now called for are three self contained vertical triple expansion crank and fly wheel pumping engines, each to have a daily capacity of 25,000,000 gallons for the 24 hours; also three self contained vertical triple expansion crank and fly wheel pumping engines, each of capacity of 12,000,000 gallons per day of 24 hours; also one electric crane of not less than 30 tons capacity and boilers of sufficient capacity to operate the six specified engines. The Water Works Commission is also in the market for all other boiler and engine room accessories and equipment; full specifications can be had by applying to the proper parties.

The Queen City Brass & Iron Works, who were formerly located on Second street, this city, have just removed to the new plant on Spring Grove avenue, which they started in full operation about March 10. They are manufacturers of plumbers', steam fitters', engine and water works valves, fittings and supplies. The new buildings give them an increase of about 50 per cent. capacity over the old quarters, and they are starting out in their new quarters with as fine an outlook as they could well wish for. The only thing that is troubling them just at present is the fact that owing to the recent move they are away behind on their old orders, and new work is coming in as rapidly as could be expected. The new plant is divided into three separate buildings. The office and warehouse building, which fronts 100 feet on Spring Grove avenue, is two stories in height and has a depth of 100 feet. In the rear of this, extending through to the street on the north, are the foundry, 100 x 60 feet, and one story in height, and the finishing building, 100 x 200 feet, also one story in height. In addition to the regular work they are now getting out a new catalogue, which they expect to present to the trade shortly.

The Cincinnati Planer Company are taking advantage of the opening of spring to renew operations upon the addition to the plant which has been resting through the winter months. This addition will be on the lot adjoining the original building on the north, and when completed will give them about 75 per cent. additional floor space. It is understood that they will get the new shop in operation some time within the next six months.

The Rahn-Mayer Carpenter Company, makers of lathes, are just getting out a new heavily built 26-inch lathe. It will be ready for the market in a few weeks. This is but one step in the progress of the company to getting out a complete line of from 16 to 30 inch engine turrets and gap lathes.

The Vanderwoort Engineering Company of Champaign, Ill., have recently bought quite a shop equipment. The Marshall & Huschart Company of Chicago, Ill., captured the big end of the order through their Cincinnati representative, Philip Geier. The lathe order was taken by the Bradford Lathe Company of this city.

The Pittsburgh Locomotive Works of Allegheny, Pa., are building 20 railway engines of the consolidated type for shipment to India.

HARDWARE.

WITH this issue our subscribers will receive the new edition of THE IRON AGE INDEX SUPPLEMENT, to which we invite special attention. Containing, as it does, a classification of the products of about 1200 manufacturers who are advertisers in our columns, it is undoubtedly the most complete and practical directory of manufacturers in the Iron, Hardware and related trades. It has been compiled with especial care with a view to making it not only comprehensive but absolutely accurate and so arranged as to enable buyers, whether manufacturers or merchants, to find the addresses of the makers of any given product in the lines to which it relates. The usefulness to the trade of the former issues of this index is a guarantee that this new edition, materially enlarged and in many ways improved, will be of still greater service.

The Hardware merchant is usually looked up to as exceptionally well posted in matters connected with the various branches of the trade. He is supposed to be a repository of information in the wide field covered by the metal industries. Inquiries are constantly coming to him concerning a multitude of matters relating to the trade—it may be some new tool or article of House-furnishing Hardware, some special machinery or supplies connected with some local improvement or enterprise, some feature of the extraordinary movement in the direction of consolidation of manufacturing interests. To keep even superficially informed in all these matters he finds it necessary to make use of manifold sources of information. The trade paper, provided it fulfills its office, is of invaluable service to him if its pages of reading matter and advertising are put to proper use. In these days, however, when the demands of business are so exacting he will need all the helps obtainable which simplify and classify the complicated information of which he is required to make use. It was to meet this need in regard to the great consolidations which have been taking place in the trade that THE IRON AGE CONSOLIDATION SUPPLEMENT was recently issued, putting in clear and compact form a great mass of information on the subject to which it relates. With a view to serving a similar purpose THE IRON AGE INDEX SUPPLEMENT referred to above is issued. As a compendium of information as to the products of manufacturers it will be found of special value. While it will naturally be used principally for reference when it is desired to obtain the address of a manufacturer of a certain article or product, it will repay careful study by those who wish to keep in touch with the progress and *personnel* of the trade. It will be especially useful in these times when it is necessary for the trade to come into close contact with the manufacturers and to be apprised definitely in regard to their products.

If the average retailer was in position to buy his goods in the same large quantities as the catalogue houses, competition from this source need have no terrors for him. One secret of catalogue house low prices lies in the fact that their purchases are made on such a large scale that they are practically on the basis of the jobber, and in selling they are enabled, if necessary, to eliminate what should be the retailer's profit. If the retailer says nothing and simply cuts his prices to meet theirs, he will be likely soon to find his balance on the wrong side of the ledger. In view of this

condition of things it is obvious that the retail merchant should make proper efforts to obtain goods at prices approximating as nearly as possible those paid by the catalogue houses and department stores, so as to be in a better position to meet their competition. In the meantime he must resort to argument and display skill in salesmanship, so as to hold the trade that might otherwise be taken from him. Some arguments which may be used in this connection are referred to in a communication in another column.

A new list, that on Bright Wire Goods, is announced this week and given among Notes on Prices. This change, while it will be regretted by the trade on account of the necessity it entails of revising buying and selling prices, is, we are advised by the manufacturers, required in view of the fact that the former list failed to be proportioned to the cost of the goods under the prices ruling for Wire. In this connection the trade will note with satisfaction the disclaimer made by prominent houses of any disposition on the part of the Jobbing trade to favor unnecessary changes in lists, involving as it does so much inconvenience to the merchants large and small. A broad view of the interests of the trade should lead manufacturers and Jobbers alike to regard the advance of the retailer in trade information as well as in business methods as promising well for the growth of his business, in which both are so directly interested.

Condition of Trade

There is more or less revision of prices being made by the manufacturers, caused in many cases by the advances which have taken place in Iron and Steel. The increased cost thus entailed necessitates frequent withdrawal of extreme quotations, especially on heavy goods, which are naturally most affected by this influence. Manufacturers, too, are generally pursuing a conservative policy in regard to future orders, as they contemplate the possibility of still higher prices for material. The trade, on the other hand, are not disposed to purchase speculatively at present relatively high costs. Some goods which are recognized as low are in active demand, and the volume of current business in general lines is quite satisfactory. There is a good deal of complaint that it is difficult to obtain some kinds of goods with sufficient promptness. At the same time there seems to be something of a lull in the demand of the jobbers upon manufacturers in the ordinary run of Hardware. This is regarded as an indication simply that the jobbers have covered their present wants and are now giving their attention to marketing the goods. Export business is, on the whole, in very satisfactory shape, the outgo of Hardware and related products being very large, in spite of the conditions which tend to disturb trade with some countries which otherwise would be taking a much larger quantity of American goods.

Chicago.

(By Telegraph.)

The demand for Hardware keeps up amazingly, when climatic conditions are considered. The weather has been exceedingly inclement for at least a month and the roads are in wretched condition throughout the West. Nevertheless the local jobbing houses have all that time found their facilities taxed to the utmost to meet the wants of their customers. Jobbers are harassed by demands for more prompt shipment and manufacturers are equally burdened with complaints from jobbers. Stocks of all kinds of goods, even the most staple articles, are far below their normal condition at this time, and it would appear that before the season is ended a consider-

able section of trade will be unable to supply all their customers' wants for seasonable goods.

St. Louis

The month of March is considered by jobbers as having been the record breaker in the Hardware business of St. Louis. Heavy as were the sales for the first three weeks in the month, the shipments made during the last week proved to be the largest. Every line is in demand. The noticeably active movement is in Wire products, for which the demand this year has proven unprecedented. Makers of Woven Wire Fencing, Fly Screen Cloth and Poultry Netting do not seem to catch up with their orders, and Wire Nail and Barb Wire shipments are also behind. Prices, owing to the heavy demand, are very firm. Black and Galvanized Sheet Steel is being freely specified, and owing to the activity in building circles the demand for Roofing Tin is heavy. Locally the number of new buildings under consideration promises widespread activity in the immediate future among the St. Louis building trades.

Louisville.

W. B. BELKNAP & Co.—The market conditions are still favorable. Manufactured products, such as Sledges, Hammers, Horse Nails, &c., have begun to feel the impetus imparted by advances in pig, billets and slabs. The manufacturers have not been overanxious, apparently, to put prices up, but buyers have insisted on contracting for liberal quantities, not only for the future, but for immediate shipment. They really have made the market rather than the rolling mills and forges.

News from the steel combinations, accomplished and projected, has taken the place of interest in the daily paper alongside the doings in society and the latest lynching. In short, these great figures and schemes are undeniably sensational, and gentlemen with a genius akin to Jules Verne's are best qualified to write them up.

The Iron Age of March 21 had something to say about the promptings of the jobbers to manufacturers to change elaborate and intricate lists in order to obfuscate the intellect of the minor and retail buyers. We believe the trade to a unit will repudiate this imputation. At least, those will who have undertaken to get out elaborate catalogues at the cost of thousands of dollars, and before the binder's paste is dry see the most expensive pages rendered obsolete or valueless by a new shake up in the relative values of Screws, Locks, Bolts, or whatever it may be. It is a matter of necessity, we take it, that changes do occur, and there is no such thing as preventing them, much as we at times regret them, and costs are recast by the variations in their several factors, labor, raw material, transportation, &c. It would be absurd to think that a card once made would be good for all time, but most of us would like to see them good for a longer time than they often are. We are no advocate of short lived catalogues.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—The closing days of March record no change in the trade situation. The demand for goods is strong, and the jobbers have all the orders they can take care of. We have received notice of advance in price of many lines, and are sorry to have to report that the jobbers are not keeping apace with the advances made by the manufacturers, and are inclined to sell a while longer at or near the old figures. While some goods are perhaps higher than they should be, we believe the unusually prosperous condition of the country, and the very urgent demand for goods, should justify the jobbing trade in following the manufacturers in making advances. Collections are remarkably good for this season.

Our city is showing more signs of prosperity than it has for many years. Several new manufacturers have started recently, and all the old ones are running full time. The Louisville & Nashville Railroad Company, who have for many years enjoyed a monopoly of the railroad business at Nashville, will soon have very spirited competition. The Tennessee Central Railway Company have just completed their line of road from Emory Gap, Tenn., through the range of the Cumber-

land Mountains, making connection with the Nashville & Knoxville Railroad at Monterey, Tenn. They have leased the Nashville & Knoxville Railroad, which extends from Monterey, Tenn., to Lebanon, Tenn., for a term of 99 years. They now have a proposition from the Nashville, Chattanooga & St. Louis Railroad Company to lease them the Lebanon Branch of the National, Chattanooga & St. Louis Railroad, which extends from Lebanon, Tenn., to Nashville. This proposition they will either accept in a few days, or build from Lebanon to Nashville within the next few months. The city of Nashville has also voted the Nashville, Florence & Northern Railroad \$1,000,000 in bonds for the completion of the road from Litchfield, Ky., on the line of the Illinois Central road, through Nashville to Florence, Ala., on the Southern Railroad. When these roads are completed it will give us one additional competing line north and south, and one east and west. With these increased facilities we expect to see rapid increase in the population and the volume of business of our city.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—No funnel shaped cloud has made its appearance on the business horizon of the Pacific Northwest. The telegraph reports of snow storms blocking rail service in some sections, of floods in others and tornadoes in many, seem almost improbable to us with the thermometer reading from 60 to 70 degrees. These reports count in part for the 14,000 people that passed through St. Paul from February 14 to March 20, to say nothing of the thousands at the same time passing Omaha and other transcontinental gateways, seeking homes in Oregon and Washington.

We do not wonder that Marshall-Wells Hardware Company, knowing of the movement this way, have determined to enter this field, and rented property in which to carry stock of heavy goods. At the same time we feel their action is an indorsement of the claim that our city will in the future, as it has been in the past, be the financial and business center of that section drained by the Columbia River.

Trade is moving in the same even channel that it has for some time past. Just enough to keep every one keyed up, and no loafing.

We wish to commend the policy of the "powers that be" in the Axe business in making the reduction in price lately put into effect, and certainly think they erred in not reducing prices of Scythes at the same time. The next in order is the Stove combine, but when the change comes it will probably be in the nature of a cyclone.

Baltimore.

CARLIN & FULTON.—The month of April has opened auspiciously from both points of view, weather and business. From all trade reports the necessities of the gigantic consolidations among the metal industries for revenues with which to pay interest and dividends are being provided for by an enormous business and by higher prices for all products.

The effect of this great and increasing demand is far reaching. Every day we hear of some change in price in manufactured goods necessitated by higher raw material. New lists and reduced discounts are in order, and though the advances as yet have not been radical they are nevertheless occurring and will no doubt continue.

Mr. Carnegie is credited with the saying that "Iron is either a king or a pauper." While it has not during the past year reached the latter condition, nevertheless its kingly attributes were taken from it, and it was temporarily dethroned when a year ago this month the whole business world was startled by the unexpected reduction by the American Steel & Wire Company of \$20 per ton on Wire and \$1 per keg on Nails. This came, as every one remembers, like a thunderbolt from a clear sky, and the depression which followed in all lines of business is still fresh in our memory.

Fortunately for business, once more cotton became king, and the high prices which ruled for that commodity made atonement for the depression occasioned by the reduction which happened in the Iron and Steel market. The high prices for cotton fortunately came at

times when the farmer received the benefit of the market instead of its benefiting merely the speculator, and millions of dollars have been added to the wealth of the South and have gone into general circulation, enabling that section now to come to the rescue and by its requirements lend a helping hand toward restoring King Iron to the throne again.

While we may not approve of the tendency toward concentration which exists in the business world, we must recognize the fact that at the present time there is a stability to the market and an improvement in values which would not have happened through an open market. Since January 1 in many lines of goods, especially supplies, the ability of the factories has been greatly taxed to make prompt shipments, and now the demand for Poultry Netting and Wire Cloth is something enormous, and there is the old experience of customers waiting until the last minute before specifying for seasonable goods and then being surprised that the factories cannot supply their wants immediately. There are many goods at to-day's prices which, in our opinion, our friends would do well to purchase in anticipation of but not in excess of their legitimate wants.

We do not look for the abnormal advances of 1899, but believe there will be a gradual and a conservative advance in many goods, occasioned partly by arbitrary power and very largely by healthy demand.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The entering of the month of April has apparently given a more cheerful feeling to the average retail buyer, doubtless influenced by his own trade surroundings. This, however, is not in any way detracting from the trade of the past quarter of the year, which, we feel, has in volume exceeded the corresponding quarters of the previous two years.

The tone of the general market is quite healthful, as far as apparent, and prices on many lines of goods are firm, and we can well add on these particular lines goods are comparatively scarce. There are some fears entertained lest on an occasional article thus affected manufacturers should make the mistake they did a couple of years ago and advance prices in excess of the actual extra cost corresponding with the extra cost of the material. The early indications of crop prospects will to some extent control these possibilities.

Certainly nowhere in the known world are the conditions of the market and market values so readily obtainable as in this country from trade journals containing weekly full information regarding trade conditions and trade influence upon market values. Then the commercial travelers, now so indispensable to trade, keep their customers fully informed of the activity of the market as well as values, and frequently are able to inform their customers of prospective values. Beyond this, there are many jobbers in the country who, for the convenience of their customers, invest large sums of money in catalogues and price-lists expressly for the convenience of their customers. These catalogues are practically duplicates of all the home house information for daily reference. The changes in the variety of goods manufactured during the last few years, and the changes in manufacturers' established lists which have been made, have necessitated new catalogues from the fact that these various changes have made former catalogues almost practically obsolete.

It is therefore with much surprise that the members of our firm read the article in *The Iron Age* of March 21 that many changes or revisions of lists adopted by manufacturers are adopted by manufacturers reluctantly at the earnest solicitation of the jobbers, giving the reasons that the jobbers who advocate the change do so on the ground that many of the retail merchants who are slack in their business methods will find it more difficult to keep posted in regard to market values, the same article stating that persons prominently connected with jobbing associations (if not actually representatives of such associations) have advocated this policy so as to perplex the trade. No one could be more amazed than the writer was upon reading this article, and, associated as he has prominently been with associations for some years, he can safely say that no one prominently con-

nected with any influential jobbers' association has ever expressed these narrow feelings in his presence; if they entertained them they were very careful to keep them to themselves. It is a narrow view, we feel, not entertained by the progressive jobbers of the country, who never cater to make money out of the slackness of any business method of any retail merchant. We feel that such views would be unworthy of any large representative wholesale Hardware house, and we are inclined to believe that no such views exist with honorable representative houses. And we feel safe in saying there are but few progressive retail merchants who are slack in their methods; they are wide awake, up to date, and many of them intelligently able to fill important positions in any large jobbing house.

We look upon the idea as absurd upon the face of the assertion, when we take into consideration the expense of getting out a large catalogue and placing it in the hands of customers, which catalogue is made valueless through numerous changes of lists. Discounts may be changed without a disadvantage in the catalogues. But the policy suggested in that article would be suicidal in the extreme to their best interests, and nearly all the persons referred to prominently connected with jobbing associations do issue catalogues of this nature. We believe the jobbers of the country, as a rule, wherever possible prefer stability of lists, and have so expressed themselves. Isolated cases will always exist in all methods of doing business and in all suggestions made to manufacturers. No one rule is applicable to all persons in trade. There are, however, underlying principles adapted to all methods of doing business.

We write concerning this more especially as our opinion has been asked by retail merchants in trade; indeed, we might also add by jobbers in trade. We have answered the question as we do now, according to our knowledge and belief. If it exists it is the exception and not the rule, and the exception is not with large representative jobbing houses.

Boston

BIGELOW & DOWSE COMPANY.—March, with its cold and disagreeable winds, has left and we can now look for warmer and more pleasant weather, which is necessary to give to trade the proper stimulant. March is a fair month and this year the volume of business will compare favorably with last year, but the busy months in this section are April and May, when the snows have melted and the ice has left the rivers, when the trees leave out and nature takes on a new life.

As the weather improves so does trade increase. The retail dealers have not been happy the past few months, but all believe good times are coming to New England as they have already to our Western friends.

The early shipment of spring goods is greater than last year. Many new stocks have been bought in the last few weeks. There seems no reason why the coming months should not mark the commencement of a very prosperous year.

Prices of Steel and base material are firmer. Many manufacturers have made advances in their prices and the indications are that values will rule higher as the season progresses.

Omaha.

LEE-GLASS-ANDRESEN HARDWARE COMPANY.—Although weather conditions for the past week or so have been detrimental to trade, still no diminution has occurred in the general demand for Hardware. Orders from traveling salesmen come forward with pleasant regularity, and these orders are nearly all of very satisfactory proportions, and cover a wide range of seasonable and other goods. Considerable difficulty is experienced by jobbers in obtaining prompt shipments from the manufacturers of some leading lines, who claim that the demand is largely in excess of the supply, consequently immediate shipments are impossible and orders can only be executed in turn, and at the earliest possible moment.

As far as prices are concerned the general market exhibits exceptional firmness. All accounts agree that the country tributary is in excellent condition financially

and industrially, and the coming months will doubtless evidence a very large and satisfactory volume of business.

New Orleans.

A. BALDWIN & Co.—After an exceptionally heavy business during several months past there are now indications of a falling off in the general trade, fewer orders and considerable quietness in all lines. The numerous advances taking place from day to day are causing some confusion, as the average dealer is very uncertain as to exactly what to do, and this hesitancy is causing a number of them to await further developments before buying more product.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—The first quarter of the year has passed, and on the whole it has closed satisfactorily. Trade in amount has not exceeded that of the same period last year, but prices are somewhat lower and in actual goods sold this year's sale sheet shows favorably.

The weather has been all that could be hoped for in March, and it is very seldom that we see the month go through with so little really unfavorable weather. Spring is now here, and, although there will doubtless be some of what our English friends call "nasty" weather, our farmers will begin to put in their crops and seeding will soon be in active operation.

With the coming of spring and also with the strengthened confidence in prices felt by the retail dealers larger orders have been coming in, and the wholesale houses have lately been quite busy.

Prices have been firm, with a considerable number of advances, and dealers have lately not hesitated for fear of declines to buy for wants. Under present conditions there is strong confidence that prices will be firm for some time ahead, and that there will be very few exceptions to this, except in occasional instances, as Axes, in which other conditions than those of actual cost and legitimate profit will control the price. The tone of the market is strong, and it will very probably remain so until affected by unfavorable crops or unexpected foreign hindrances, which may not disturb the markets during the year.

But there is nothing, either at home or abroad, to justify large advances in any lines, and it is not probable that manufacturers will be weak enough to take this course. It is a time for prudent, conservative action on their part and, if this shall prevail, a strong demand and steady market prices for some time ahead may reasonably be expected.

Notes on Prices.

Wire Nails.—The Wire Nail market continues strong and active. Requirements show no falling off, taxing the capacity of the mills to fill orders at all promptly. While the existing conditions might be construed as justifying an advance, conservative counsels in this matter are prevailing with the manufacturers, and no change in prices has been made, nor intimation of a change in the near future. Quotations continue as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.30
To jobbers in less than carload lots.....	2.35
To retailers in carload lots.....	2.40
To retailers in less than carload lots.....	2.50

New York.—The local market on small lots of Wire Nails at store is more even in price owing to concerted action among jobbers. This is possibly owing to the exhaustion of stocks bought at lower than present prices. It is understood that a uniform quotation of \$2.60 is now made in small lots at store. Quotations are as follows:

To retailers, carloads on dock.....	\$2.53
Small lots at store.....	2.60

Chicago, by Telegraph.—Quite a general expectation prevails in the trade that April 1 would see an advance in prices. The manufacturers, however, have not made an advance, and it is uncertain whether one will be made this spring. Conditions seem to warrant it both

from the standpoint of dearer raw materials as well as the heavy demand, but conservative ideas are governing those who make prices, at least for the present. All factories are turning out Nails as rapidly as possible, but are still behind on deliveries. The April demand promises to be even greater than that of March. Jobbers report a heavy volume of business. Carload lots are held at \$2.45 and small lots at \$2.55, with an occasional concession to \$2.50 to the best traders.

St. Louis.—The extraordinary demand for Wire Nails shows no decrease whatever. All mills are pushed to the limit in making shipments and have not yet caught up with orders. The building trades report increased activity as spring is entered, and the demand for Nails is therefore expected to be even more pronounced. The price to retailers in carload lots is \$2.50, base; smaller lots being quoted at \$2.55, base.

Pittsburgh.—There is a fair demand for Wire Nails, but not as heavy in this district as reported from other sections of the country. It is claimed that no advance in price of Wire Nails is contemplated for the present at least. The United States Steel Corporation will no doubt pursue a conservative policy in regard to prices of Wire Nails, the same as on other products. We are advised that prices of small lots of Nails from store are being better adhered to than for some time past. Quotations are as follows, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots.....	\$2.30
To jobbers in less than carload lots.....	2.35
To retailers in carload lots.....	2.40
To retailers in less than carload lots.....	2.50

Cut Nails.—The demand for Cut Nails continues in about the same volume as it has for some time past. The market remains firm and quotations unchanged, as follows, f.o.b. Pittsburgh, plus the actual freight to point of destination; terms 60 days, or 2 per cent. off in 10 days:

Carload lots	\$2.00
To jobbers in less than carload lots.....	2.05
To retailers in less than carload lots.....	2.20

New York.—Cut Nails are being ordered in seasonable quantity by the trade tributary to this point. Quotations for carload and less than carload lots are now based on a delivered price, f.o.b. Pittsburgh, plus the actual freight, and are as follows:

To jobbers in carload lots on dock.....	\$2.13
To jobbers in less than carload lots on dock.....	2.18
To retailers in less than carload lots on dock.....	2.36
Small lots from store.....	2.25

Irregularity in the price to retailers in less than carload lots on dock continues.

Chicago, by Telegraph.—Orders run up to a very good quantity, but the demand still continues within certain well defined limits. Jobbers quote small lots from stock at \$2.35.

St. Louis.—Sales of Cut Nails are seen to be in keeping with the heavy shipments of Wire Nails. The smaller sizes are in good movement. Prices range from \$2.35 to \$2.45, base.

Pittsburgh.—March prices of Cut Nails have been reaffirmed for April delivery. There is a fair demand and most of the Cut Nail mills are busy. To Jobbers, prices are on carload lots \$2, and on less quantities \$2.05, f.o.b. Pittsburgh, plus the actual freight rates. To small dealers and consumers \$2.20 rates, f.o.b. Pittsburgh, plus the actual current rate; terms 60 days, less 2 per cent. for cash in 10 days.

Barb Wire.—Requirements for Barb Wire continue large, the demand coming from various sections of the country. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

To jobbers in carload lots, Painted.....	\$2.60
To jobbers in carload lots, Galvanized.....	2.90
To jobbers in less than carload lots, Painted.....	2.65
To jobbers in less than carload lots, Galvanized.....	2.95
To retailers in carload lots, Painted.....	2.70
To retailers in carload lots, Galvanized.....	3.00
To retailers in less than carload lots, Painted.....	2.80
To retailers in less than carload lots, Galvanized.....	3.10

Chicago, by Telegraph.—The leading manufacturers are from two to four weeks in arrears on shipments and find it impossible while the present demand exists to catch up. Orders are being received in as great quantity as in March. Carload lots are held at \$2.75 for Painted and \$3.05 for Galvanized. Less than carloads are quoted at \$2.85 and \$3.15, respectively, with shading of 5 cents to best buyers.

St. Louis.—Sales of Barb Wire continue in very large volume. The heavy demand for Field Fencing is outdistanced by the large consumption of Barb Wire, and shipments are all too long deferred to suit users' necessities. Painted in carloads to retailers is held at \$2.80, smaller lots \$2.85. Galvanized is 30 cents higher.

Pittsburgh.—Demand for Barb Wire continues heavy, and the mills are running to full capacity and shipping product as fast as made. Business at this season of the year is away ahead of previous years. For domestic trade we quote: Galvanized Barb Wire, \$2.90, in carload lots to jobbers, and Painted, \$2.60. Terms, 60 days net, 2 per cent. discount for cash in 10 days, f.o.b. Pittsburgh.

Plain Wire.—Trade continues heavy in Plain Wire, owing largely to the requirements of manufacturing consumers. The market is firm at the following quotations, f.o.b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days:

	Base sizes.	
	Plain.	Galv.
To jobbers in carload lots.....	\$2.25	\$2.65
To jobbers in less than carload lots.....	2.30	2.70
To retailers in carload lots.....	2.35	2.75
To retailers in less than carload lots.....	2.45	2.85

The above prices are for the base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances.

Chicago, by Telegraph.—Manufacturers continue deluged with new business and are about two weeks behind their orders. The heavy demand for Plain Wire is partly caused by the extremely large trade in Woven Field Fencing. The Fencing manufacturers are asking their customers to send orders in now for June delivery if they desire satisfactory shipments.

Pittsburgh.—There is a heavy demand for all kinds of Plain Wire and orders seem to be increasing right along. The Woven Wire Fence makers are using enormous quantities of Wire for Fencing. The Wire business during the winter months has been the heaviest ever known in the history of the Wire trade. For domestic trade we quote:

	Plain.
To jobbers in carload lots.....	\$2.25
To jobbers in less than carload lots.....	2.30
To retailers in carload lots.....	2.35
To retailers in less than carload lots.....	2.45

Galvanized Wire up to No. 14 is 40 cents advance on Plain; Nos. 15 and 16, 75 cents advance, and Nos. 17 and 18, \$1 advance. Terms are 60 days net, with 2 per cent. off for cash in 10 days, f.o.b. Pittsburgh.

Wire Cloth.—There continues to be a heavy demand for Wire Cloth, and jobbers and retailers are experiencing some difficulty in obtaining goods as promptly as they desire. The manufacturers are holding prices very firmly. As a result of the existing condition, jobbers' prices to the retail trade are in many cases somewhat higher, and the quotation of \$1 to \$1.10 represents the market, the former figure being, however, not so readily obtainable as it has been.

Bright Wire Goods.—Under date April 1, the manufacturers of Bright Wire Goods announce a new list, which is given herewith. This change in list has been necessitated by the course of the Wire market. It will be observed that on the smaller sizes the changes are not important, but are most marked on the extreme sizes, where the extra cost of material has made the old lists out of proportion. The list given is that of the Wire Goods Company, Worcester, Mass., other lists embodying the same prices being issued by the different manufacturers. There will probably be some difference in the regularly announced discounts of the various makers, but in a general way the new list may be referred to as subject to a discount of 85 per cent.

LIST OF BRIGHT WIRE GOODS, APRIL 1, 1901.

Bright Wire Screw Eyes.

0	1	2	3	4	5	6	7
\$11.00	9.00	7.00	5.50	4.50	3.50	3.00	2.50
8	9	10	11	12	13	14	
2.00	1.75	1.50	1.30	1.20	1.10	1.05	
104	105	106	107	108	109		
4.50	3.50	3.00	2.50	2.00			
110	111	112	113	114	115		
1.50	1.30	1.20	1.10	1.05			
204	205	206	207	208	209	210	
4.50	3.50	3.00	2.50	2.00	1.75	1.50	
211	212	213	214	215	216		
1.30	1.20	1.10	1.05	1.05	1.05		

Half numbers same list.

Brass Wire Screw Eyes.

1000	1001	1002	1003	1004	1005	1006	1007
60.00	48.00	37.50	30.00	24.00	19.50	15.00	12.00
1008	1009	1010	1011	1012	1013	1014	1015
9.00	7.50	6.00	5.25	3.75	3.00	2.50	2.50
1104	1105	1106	1107	1108	1109		
24.00	19.50	15.00	12.00	9.00			
1110	1111	1112	1113	1114	1115		
6.00	5.25	3.75	3.00	2.50			

Half numbers same list.

Bright Wire Screw Hooks.

0	1	2	3	4	5	6	6½
15.00	12.00	10.00	8.00	6.50	5.50	4.50	4.00
7	8	9	10	11	12	13	14
3.50	3.00	2.50	2.25	2.00	1.80	1.70	1.60
104	105	106	107	108	109		
6.50	5.50	4.50	3.50	3.00			
110	111	112	113	114			
2.25	2.00	1.80	1.70				

Brass Wire Screw Hooks.

1000	1001	1002	1003	1004	1005	1006	1007
90.00	75.00	60.00	45.00	36.00	27.00	22.50	19.50
1007	1008	1009	1010	1011	1012	1013	1014
16.50	13.50	10.50	8.25	6.00	4.50	3.75	3.00
1100	1101	1102	1103	1104	1105	1106	1107
90.00	75.00	60.00	45.00	36.00	27.00	22.50	16.50
1108	1109	1110	1111	1112	1113	1114	
13.50	10.50	8.25	6.00	4.50	3.75	3.00	

No. 30, Bright Wire Cornice Hooks and Eyes

2	2½	3	3½	4	4½	5	5½ inch.
9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00
6	7	8	9	10	11	12	12 inch.

17.00	18.00	19.00	20.00	21.00	22.00	23.00
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No. 35, Bright Wire Cornice Hooks, without Eyes.

2	2½	3	3½	4	4½	5	5½ inch.
7.00	8.00	9.00	10.00	11.00	12.00	13.00	14.00
6	7	8	9	10	11	12	12 inch.

15.00	16.00	17.00	18.00	19.00	20.00	21.00
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No. 40, Bright Wire Gate Hooks and Eyes.

1½	2	2½	3	3½	4	4½	5	5½	6	7
4.75	5.75	6.75	8.00	9.50	10.50	14.00	17.00	20.00	22.00	24.00

8	9	10	11	12	13	14	15	16
26.00	28.00	30.00	35.00	40.00	45.00	50.00	55.00	60.00

No. 1040, Brass Wire Gate Hooks and Eyes.

1½	2	2½	3	3½	4	4½	5	5½	6
20.00	25.00	30.00	40.00	50.00					
4½	5	5½			6				

70.00	80.00	90.00	100.00	
8	9	10	11	12

115.00	120.00	125.00	130.00	135.00	140.00	145.00	150.00	155.00
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Iron and Brass Wire Bird Cage Eyes.

18	1018	218	1218
3.00	15.00	2.50	12.00

Stair Rod Eyes.

408	409	415	417	410
Bright.	Enamored.	Brass plated.	Nickel plated.	Brass.

2.50	2.70	3.75	3.75	12.00
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Bright Wire Mosquito Bar Eyes.

	406	416	426	436
Inside diameter of eye.....	56	1	1½	1¼ inch.
	6.75	7.50	8.25	9.00

Bright Wire Cup Hooks.

600	601	602	603	604	605	606	607
15.00	12.00	10.00	8.00	6.50	5.50	4.50	3.50
608	609	610	611	612	613	614	

3.00	2.50	2.25	2.00	1.80	1.70	1.60	
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Brass Wire Cup Hooks.

1600	1601	1602	1603	1604	1605	1606	1607
90.00	75.00	60.00	45.00	36.00	27.00	22.50	16.50
1608	1609	1610	1611	1612	1613	1614	

13.50	10.50	8.25	6.00	4.50	3.75	3.00	
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Bright Wire Blunt Point Screw Hooks.

2700	2701	2702	2703	2704	2705	2706	2707
15.00	12.00	10.00	8.00	6.50	5.50	4.50	3.50
2708	2709	2710	2711	2712	2713	2714	

3.00	2.50	2.25	2.00	1.80	1.70	1.60	
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Tacks.—The improvement in the Tack market which we have recently referred to continues. Nearly all the manufacturers, apparently without any concert of action, are withdrawing extreme quotations and announcing somewhat higher prices. As usual in this line of goods, there is considerable diversity in the quotations of the various makers on the different kinds of Tacks. The increased cost of Tack Plate and the difficulty in obtaining it is an important feature of the situation. At the same time there is a heavy demand upon the manufacturers, which reflects the current large volume of business and the excellent feeling which prevails in the trade. Quotations in a general way may be represented by the following revised quotations of the Shelton Company, Shelton, Conn., and 64 Reade street, New York:

Discount.

Upholsterers' Tacks.....	90 and 40 %
Bill Posters' Tacks.....	90 and 40 %
Gimp Tacks.....	90 and 40 %
S. S. Cut Tacks.....	90 and 30 %
American Cut Tacks.....	90 and 25 %
Trimmers' Tacks.....	90 and 30 %
Lace Tacks.....	90 and 40 %
Looking Glass Tacks.....	70 and 10 %
Hungarian Nails.....	80 and 15 %
Trunk and Clout Nails.....	80 and 5 %

Axes.—The condition of the Axe market does not show improvement as yet. The low prices which were determined upon by the leading interest are being met by their principal competitors. It is understood that slightly lower prices are being developed under the stress of efforts to secure business. The large trade are placing orders freely, under the opinion that \$5 for the best factory brands, a figure which is slightly shaded on those not held in quite so high esteem, is a safe purchase. This state of things, while it relates to the prices which are current for next season's trade, naturally affects the present price of Axes, even in the relatively small quantities which the retail merchants purchase.

Paris Green.—Comparatively little interest has been taken by purchasers of Paris Green in securing their season's supply. The experience of the past year or two does not encourage buying much in advance of actual requirements. In some sections of the country quite a quantity of Green was carried over last season. Quotations are as follows:

In Arsenic kegs or casks.....	12½c.
In kegs, 100 to 175 pounds.....	13c.
In kits, 14, 28, 56 pounds.....	14c.
In paper boxes, 2 to 5 pounds.....	14c.
In paper boxes, 1 pound.....	14½c.
In paper boxes, ½ pound.....	15½c.
In paper boxes, ¼ pound.....	16½c.

Cordage.—The demand for Rope continues fair at former prices. Orders are for conservative quantities, with an absence of speculative features in buying. Quotations are as follows, on a basis of 7-16-inch and larger: Manila, 10½ cents; Sisal, 8 cents per pound. A rebate of ¼ cent per pound is made for large quantities.

Glass.—The advance in the price of Window Glass by the Jobbers' Association, foreshadowed in our last issue, has been made, and present prices are as follows:

Discount.

Less than carloads.....	85 %
Carloads.....	85 and 10 and 2½ %

The advances in Glass prices since January 1 have been radical, and the question has arisen in the minds of some whether present prices will not act as a check upon consumption.

Paints and Colors.—**Leads.**—There has been some improvement in demand for White Lead in Oil, owing to the advancing season, and the anticipation that with settled weather requirements will increase in this direction. Quotations are as follows: In lots of 500 pounds and over, 6½ cents per pound; in lots of less than 500 pounds, 7 cents per pound.

Oils.—**Linseed Oil.**—Some improvement is noticed in the number of orders for prompt shipment and nearby deliveries. As a rule, business is confined to small lots, and the market is not considered a particularly strong one. City Raw is quoted from 61 to 62 cents per gallon, according to quantity. State and Western brands are quoted, according to quantity, from 57 to 58 cents per gallon. Boiled Oil is 2 cents per gallon advance on Raw.

How to Meet Catalogue House Competition.

THE following suggestions are made by a prominent merchant in regard to arguments which may be used by the retail merchant to prevent his customers from going to catalogue houses:

I. If the article is small, the trouble of ordering and cost of transportation will generally equalize prices.

II. If prices are still in favor of the catalogue house, the privilege, seldom denied by the retailer, of return and quick exchange of any goods found defective, is worth something to the purchaser.

III. The privilege of handling and examining the goods before paying down one cent, and the further advantage of immediate delivery, is worth something and should be dilated on.

IV. Where brands are not named, it is a question pure and simple of talking quality. The merchant should insist on a reasonable profit. There is no doubt that the catalogue house gets a good profit on goods under their own brand or bearing no brand.

V. A local dealer, even though in business for his own benefit, is still a public convenience. Most reasonable men will contribute in the shape of a legitimate profit to sustain the local store. A house in Chicago may offer a certain size Carriage Bolt at 6 cents each, but when the farmer in Texas needs one or two for his Wagon it is worth a dollar to him to be able to get them in ten minutes from the town store, even at 10 cents each.

VI. In the smaller towns patriotism will be found to be a potent argument. Let the merchant ask his customer who talks of patronizing a catalogue house a few questions such as these:

Do Messrs. Sages, Deerhound & Co. of Chicago pay any license to this county?

Do they pay any taxes here?

Do they employ any clerks who live in this town and spend their wages here?

Do they patronize the butcher or baker around the corner, or any of the other merchants in this town?

Do they contribute to the support of our Churches Schools or Theatres?

Are they your friends in any way?

Do they treat you as an honest man and trust you even for a paltry dollar or two?

If the goods are lost in transit, who is out of pocket?

Invariably some of the above arguments will strike home. They will always make a customer stop and think—will generally cause him to buy.

Notes on Foreign Trade.

American Hardware in Denmark.

FROM A SPECIAL CORRESPONDENT.

AMERICAN Hardware is comparatively well known in Denmark, and every year marks an advance. There are, however, possibilities of much faster development if United States manufacturers not represented in Copenhagen would procure a list of the leading Hardware dealers and send them catalogues.

How Danish Business is Mainly Done.

At present a large part of the business is done through American commission houses, some of which have head offices or branches in Hamburg (Germany), and when the Danish dealer hears of some new American article he usually writes to one of these houses, asking them to procure it for him; and if it suits the market, which is generally the case, he orders more—through the commission house.

Supplementing Commission House Enterprise.

He cannot break away from the commission house, or he thinks he cannot, which amounts to the same thing, as he depends on it every time he hears of an American article which he is desirous of keeping in stock. And they do not always get what they want from the commission house. One dealer told me of a case where the commission house claimed to be unable to get him what he wanted, but through another source he was brought in contact with the manufacturers of the article. Another man told me he wrote to a prominent export organization for manufacturers of power coffee mills and got the addresses of several manufacturers of hand coffee grinders used in kitchens. He then drew the inference that power Coffee Mills were not made in the United States, and only when I showed him a picture in *The Iron Age* did he change his opinion.

He had previously written about machines for making fishing nets—such machines are imported into Denmark from France—and had been told that no such machines were known in the United States; hence his jumping at the conclusion about the Coffee Mills.

One Hardware dealer, the largest, has a line of Agricultural Implements and Tools; the others carry mostly lines of Hardware, Tools, including Garden Tools, Household Goods and some Crockery and Glassware.

Danish Tariff No Protection to Domestic Manufacturer.

The domestic manufacture of Hardware is limited and the tariff, which dates back to 1863, gives no protection to Danish manufacturers.

Germany, Sweden, United States, England and France are at present the chief supplying countries of Hardware and Tools to Denmark.

German manufactures are cheaper than the manufactures of other nations, but the quality is frequently out of proportion to the value. Swedish goods are well made and enjoy a great reputation for fine quality. American goods are in some instances a trifle too high priced, but a closer connection between American manufacturers and Danish importers would remove a great deal of this obstacle.

How Danish Tradesmen Are Supplied.

The Danish Hardware dealers located in Copenhagen supply the whole country in competition with traveling salesmen from Germany and England, especially from the former country. These travelers call on merchants in the larger towns, being restricted by law from visiting towns under a certain size.

Merchants Who Prefer Direct Trade with America.

The Copenhagen dealers prefer to buy direct from the manufacturers in America, and always insist on having the sole agency for their country. The trade is mostly in the hands of houses who have been established

over 20 years and enjoy good credit, although most of them settle for American goods by paying cash in two weeks after arrival. German houses usually allow three months' open credit.

A New Market for Hardware Specialties.

A number of American Hardware specialties are unknown in Denmark, and several specialties used in Denmark and the other Scandinavian countries could undoubtedly be manufactured in America and sold at competitive prices. Very few improved household specialties are in the market, and, as the servant question is gradually becoming a problem there also, such goods should meet with good demand.

An Opening for Builders' Hardware, Tools, &c.

American manufacturers are very slightly represented in Builders' Hardware, and I saw only a few American Stocks and Dies. The same applies to Drawing Knives, Screw Drivers; Hammers and a number of other articles, which are imported from Germany and France.

Steamer Lines and Principal Dealers.

There are direct steamers to Copenhagen from Boston, New York, Newport News and New Orleans. The three largest Hardware dealers and importers are C. Th. Rom & Co., Alexhus, Copenhagen; J. P. Bövings Eft, Gothersgade, Copenhagen; T. M. Werner, Kultorvet, Copenhagen.

Japanese Trade.

FROM OUR SPECIAL CORRESPONDENT.

To the Editor: The most direct route from New York to Japan is via Vancouver, British Columbia, and the Empress line of steamers. These carry one from Vancouver to Yokohama, and after a brief stop at Victoria, B. C., there is not a break in the journey until Japan is reached. The journey across the Pacific was uneventful. We did not pass any vessels, and the only land visible was the Aleutian Islands. These are a mountainous group, the peaks of the mountains being covered with snow and appearing bleak and barren.

Yokohama

Yokohama is one of the open ports of Japan and a great trading city. I understand that it has more foreigners than any other city in Japan. Their total number is about 2000, of which about 800 are English. The entire population is 180,000.

Trade Characteristics

Trade conditions are quite different from anything in America or Europe. From the Hardware standpoint, the trade is limited. Stocks are very light and stores small. Japan seems to be a nation of small traders. Small shops devoted to different lines fill street after street. A typical Hardware store is a room, say, 20 feet square. At the back is the living room, or if, perchance, the stock is heavy, the rear room will be devoted to it and the family will live in the second, or top, story. The wife of the merchant will usually assist, keeping books, &c. It is said that when it comes to a close bargain they are often harder to deal with than the man of the firm. Clerks are usually seated on the floor either of the front or rear room, and children are often playing about the doorway.

The Trade Specialized.

Dealers seem disposed to confine themselves to narrow lines. One dealer will make a specialty of native Tools, another will sell chiefly imported Hardware of American, German and English manufacture, a third will sell Metals in a small way, while sometimes one will find a dealer selling curios (bronzes, vases, gongs, &c.), and with these a line of Carpenters' Tools.

Confidence a Prerequisite

They are very leisurely in their business methods and cannot understand the hustling American. To do business with a Japanese it is necessary to win his confidence. He desires to be approached gradually.

He will receive you courteously, order tea and spend an hour or so with you in pleasant chat. After becoming friends you will no doubt be honored with an invitation to a "tiffin" or a dinner, which may include a Geisha dance.

Climatic Conditions

The climate is largely responsible for the habits of the people. In the winter it is cold, snow is visible on all the surrounding mountains; but in summer it is exceedingly hot, and the Japanese habits conform to the leisurely customs of hot climates.

Finances.

The yen is the Japanese dollar. It is worth 100 sen, corresponding to our American cent. The value of the yen, however, is 50 cents gold, the buying power in Japan of the yen being just about the buying power of a gold dollar in the United States. It naturally costs the American or European more to live here than the native. He pays much higher rent and pays more for food and clothes. But even so, a foreigner can live more cheaply here than at home. On the other hand, the native spends what appears to us as next to nothing. Skilled labor commands 15 yen per month, or \$7.50 gold. Many grades of labor are paid much less. Trade at present in Japan is not flourishing. Money is tight. In Yokohama alone there are said to be millions of dollars of silk stored in the warehouses or "go-downs" awaiting sale. The banks have loaned heavily on these goods, and as an indication of monetary conditions, the native banks advertise in the daily papers that they will pay 7 per cent. per annum interest on deposits.

Suggestions.

It is an old story to say that the English and Germans are more particular to please customers than the Americans, but it is true. Our American manufacturers are steadily improving, but there is still much to learn, and I shall mention a few points which have come to my attention.

SUBSTITUTING.—Don't do it. At home, if a customer orders an article worth \$1 and he receives something worth \$1.10 at the \$1 price, he may be able to use it and will usually accept it. Such is not the case in the East. The buyer wants exactly what he orders. If he does not get it, he has good ground, according to his ethics, to make a claim, and he invariably does it.

LABELING.—Keep to one style of labels. Ninety per cent. of the consumers cannot read English. They identify an article by the label. If the label is changed their suspicions are aroused, and goods are commonly refused in consequence.

PACKING.—Pack strong; pack close. Remember that empty space in a case that is shipped by measurement commands a high rate of freight and is a dead loss to native importers.

FILL ORDERS PROMPTLY.—American manufacturers have the reputation of being slow.

SHIP GOODS PROPERLY.—It requires special knowledge to comply with customs regulations as well as the international treaties governing trade. Manufacturers who do not employ some house that is thoroughly familiar with special requirements invariably make mistakes that prove an expense either to them or the foreign merchant.

PATIENCE.—Bear in mind that export trade cannot be worked up as quickly as trade in our country. Do not become discouraged if it takes a year or two to get results.

DIRECT FOREIGN ORDERS.—Care should be exercised in filling orders sent by foreign merchants, even if accompanied by remittance. After a new line has been started in a foreign market, it not infrequently happens that a retail merchant will send an order to the manufacturer. It is sometimes accepted and at wholesale price. Wholesale merchants soon find out what has been done, drop the line, and a good trade is spoiled. The English merchant has the reputation of protecting the wholesale merchant or agent, whereas the American is apt to quote one price, regardless of whether the inquiry comes from a large dealer or a consumer.

HENRY T. SEYHOUR.

The New York and New Jersey Hardware and Iron Association.

THE second annual banquet of the New York and New Jersey Hardware and Iron Association was held at Muschenheim's Arena in New York, on the evening of March 28. The dinner was followed by speeches, ex-President Wm. E. Kleine acting as toastmaster.

Mr. Schluchtnar delivered a highly instructive address on the "Iron Market and Manufacturers." In the course of his remarks the statement was made that the price of Axles was too low considering the cost of material and labor, and that the goods could not always remain at the present figures. The cutting of prices, resulting in unpleasant relations with customers and misunderstandings among members of the association, was attributed to traveling representatives. The latter, it was shown, were apt to have the interest of the customer more at heart than that of the employer.

S. Otis Livingston responded to the toast "Horseshoes," and spoke on the benefits of organization. In this connection he referred to the fact that the differences between Horseshoe Nail manufacturers had recently been eliminated, and that a uniform price upon the cheaper grades of Nails had been agreed upon.

In speaking upon the subject of "Springs" E. R. Merrill touched upon the financial benefits arising from associations of this character, in the uniformity of prices secured. He alluded to the desirability of Hardware and Iron merchants supporting home manufacturers who protected the trade in the matter of prices.

The "Social Association of Members" was the subject of remarks by Charles Ruwe, in which the benefits derived from pleasant relaxation from business were emphasized.

In response to the toast, "Burns and Fires," M. Eisig entertained the company in his usual happy vein, with an allegorical presentation of the difficulties arising between seller and buyer as a result of misunderstandings. He also touched upon the success of the association in removing such difficulties.

"Annual Dinners and the Benefits Arising from Them" was the subject of remarks by Henry Ruwe. Social meetings of this kind, it was stated, were free from the annoyances incident to the frequent meetings at which complaints were disposed of, and tended to cement the feeling of fraternity among members.

Joseph Ruppert spoke in regard to "The Absent Members," making the point that those who were prevented from attending the banquet were entitled to compensation.

"Annoying Errors in Business" was the subject assigned to W. Tiebout, who illustrated the trouble arising from mistakes by reciting a number of occurrences of this kind.

The occasion was a most enjoyable and helpful one, and it is probable that more frequent gatherings of this character will be held in future. Several guests announced their intention of becoming associate members.

At the annual election the former officers and Board of Directors were re-elected for the ensuing year. The officers are as follows: President, W. T. Crane; vice-president, Joseph Ruppert; treasurer, Emil Rudolph; secretary, Henry Bodevin. The Board of Directors is as follows: M. Eisig, C. H. Tiebout, H. G. Gundrum, J. C. Bonn and P. Nielsen.

New England Hardware Dealers' Association.

THE New England Hardware Dealers' Association will hold their next monthly meeting at the United States Hotel, Boston, Wednesday, April 10. The speakers will be Charles E. Adams of Lowell, president of the Massachusetts State Board of Trade, and William R. Chester, treasurer of the Massachusetts State Board of Trade. The Entertainment Committee for the evening are William D. Parlin, S. D. Balkam and Charles O. Tukey.

SHOW WINDOW DISPLAY.

This Department is to give information in regard to the use which may advantageously be made of show windows of Hardware stores, with practical suggestions in regard to the arrangement and display of goods and other methods of attracting business.

The trade are invited to contribute information in regard to methods which have proved satisfactory, with descriptions of attractive displays. Inquiries also are solicited, to which careful attention will be given.

HOUSE CLEANING GOODS.

BY RETAILER

I have at one time or another, as the season or other incidents suggest, brought into prominence through the medium of my show window all of the different lines of goods carried in my stock. The funny man in the newspapers has held up the better half of mankind to ridicule during the house cleaning season, and as this

tal for a Dust Pan and a Dust Brush; the carpet being partly unrolled, and extending around the back of the window, forms a good background. Brooms and Patent Carpet Sweepers are also conspicuously displayed, and the window contains quite a selection of Scrub Brushes, Mops, Mop Wringers and Wooden and Tin Pails. I also have a variety of long handled Brushes such as are used for dusting cornices of rooms and for washing windows from the outside, and Rubber Window Cleaners. Many people still do whitewashing in their cellars and kalsomining in some of their upper chambers, so I have displayed a variety of Whitewash Brushes, also a small line of Ready Mixed Paints and Paint Brushes. The kitchen stove also comes in for a good shine in house cleaning, and I have shown several different kinds of Stove Polish, a good sized box of old fashioned Plum-



A House Cleaning Window.

is at hand a humorous item in our local weekly suggested that I might turn this season to account. No woman can clean house without a good many things to help her, which I carry in stock. In consequence I have arranged a show window for this purpose. I procured a board that reached across my show window, about 12 inches wide, and on this I fastened papers of Tacks with green, blue and red labels, forming the words "HOUSE CLEANING;" by wires I suspended just below this another board, on which I formed the word "TIME" by fastening Claws for drawing Tacks, of different sizes and kinds. The word "AT" I formed by a mixture of Tack Hammers and Tack Drawers, while the word "HAND" was entirely formed of Tack Hammers. Now everybody knows that shortly after the Tack Drawer gets in his work the carpet must be hung on good stout Clothes Lines and then be well beaten with Wire or Rattan Carpet Beaters; consequently I have displayed plenty of good strong Clothes Lines and Carpet Beaters. I also placed a roll of the old fashioned rag carpet, like all the old boys have seen at home, and this is standing in one corner and forms a suitable pedes-

bago, with a goodly array of Stove Polish and Brushes. It is a little early yet for house cleaning in some sections and not much is being done in my town, but my display has already been the means of selling quite a number of the goods displayed.

WHAT THE TRADE SAY.

From letters recently received from Hardware merchants we extract the following points in regard to the advantage of giving attention to this matter:

Trace Numerous Sales to Displays.

From a Hardware house in New Jersey we have received the following, that will show how the benefits of trade window advertising are seen:

We can trace numerous sales to displays. It is of common occurrence for a customer to come in and ask for some article he saw in the window several months before. Of course, while goods are in or have just been taken out of the windows, inquiries are frequent.

A Silent Salesman.

A merchant in a city in Western New York appreciates his window so highly that he calls it a "silent salesman." He says in part:

A well dressed window is a "silent salesman." It costs but a little more to dress a window in an attractive way and make it a trade winner than to throw goods into it in a hap hazard way and change the goods only as the spirit seems to move us.

Sales Materially Increased.

In speaking of the results of window displays a large Indiana firm say:

We are thoroughly convinced that the same has very materially increased our sales, not only in goods displayed, but by attracting the attention of customers and getting them into the store.

Reputation of Being Up to Date.

An Ohio merchant in writing about results obtained from show window displays says in part:

We do not feel that we can trace so many sales directly to displays, but since a merchant's windows serve as the eyes to his business, we at least get the reputation of being up to date by our constant changes along this line. In this way we do get a benefit, for even the ordinary buyer will look up or remember the neatest and best kept store. Our displaying goods in windows is based on keeping store front bright and attractive and not for any direct sales it brings.

PRIZE COMPETITION

Closing April 15, 1901.

SUBJECT:**Hardware Store Window Display.**

The matter of show window arrangement is one of recognized importance, and the object of this competition is to draw out practical information and suggestions which will be of service in guiding retail Hardware merchants in arranging their show windows so as to attract trade.

The following are suggested as some of the points which may be touched upon in considering the subject:

- The frequent neglect of window displays.*
- Common mistakes in arranging windows.*
- Advantages of attractive show windows.*
- Whether increased sales can be traced to window exhibits.*
- Fixtures for displaying goods, such as racks, shelves, stands, &c.*
- Mechanical appliances which may advantageously be used.*
- The lighting of windows.*
- The color of backgrounds.*
- How variety in display can be secured.*
- The desirability of striking and ingenious displays to attract attention.*

*The kinds of goods which yield best returns.
Whether few or many kinds of goods should be shown together.*

*Suggestions in regard to seasonable displays.
The frequency with which changes should be made.*

The care of goods exhibited to prevent them from being injured or shop worn.

Whether prices should be marked on goods in windows.

How to utilize employees' skill in window display.

The relation of window display to local advertising.

Examples of good arrangement.

NOTE I.—The above suggestions are given merely as indicating the general scope of the subject, but all contributors are at liberty to treat it in their own way.

NOTE II.—It should be borne in mind that it is desirable that the contributions be useful to retail Hardware merchants, helping them in the direction of good methods of window display. Definite practical suggestions to this end are therefore requested.

NOTE III.—Photographs or sketches are very desirable when they serve to illustrate any method of arrangement or any particular window display of which a description is given. It is not necessary that such photographs or sketches be artistic or elaborate, so long as they indicate the arrangement or display in question.

NOTE IV.—With a view to encouraging the contribution of briefer and less formal papers, as well as those covering the subject more completely, a number of prizes will be awarded ranging from \$50 to \$5. These prizes will be determined according to the practical usefulness and general merit of the contributions.

The following prizes are announced:

First prize	\$50.00
Second prize	25.00
Third prize	15.00
Fourth prize	12.50
Fifth prize	10.00
Sixth prize	9.00
Seventh prize	8.00
Eighth prize	7.00
Ninth prize	6.00
Tenth prize	5.00

This competition is open to all. We shall have the privilege of publishing any of the contributions received. Contributions are to be received not later than April 15, 1901. They should be addressed as follows:

THE IRON AGE,
232-238 William street,
New York.
WINDOW DISPLAY COMPETITION.

Miller, Sloss & Scott's New Building.

MILLER, SLOSS & SCOTT, San Francisco, Cal., have just moved into their new building on the southwest corner of Mission and Fremont streets, owned and constructed by them for their exclusive use, to replace the building they formerly occupied, which was destroyed by fire two years ago. Their fine new home occupies a space 137½ feet square, is five stories high and has a basement extending 16 feet under the sidewalk on each front. The exterior walls are of white stone, the steel structural work being made and fitted by the Pencoyd Iron Works, Philadelphia, Pa. The first floor is occupied entirely by offices, sample and shipping departments. The offices are all well lighted and spacious, there being separate offices for Messrs. Miller, Sloss and Scott, as well as one for the use of A. W. Milligan, first vice-president of the company, when in San Francisco, Mr. Milligan having charge of the Eastern branch of the house, with a suite of offices in the Gerken Building, West Broadway and Chambers street, New York, where most of his time is spent. There is also a commodious room for the private meetings of the firm.

The building is equipped with passenger and two freight elevators, together with three sidewalk and two smaller elevators, all of which are operated by electricity. An iron stairway connects all the floors from top to bottom. For the expeditious handling of goods, there is a system of chutes with buffers at the end, by means of which parcels, &c., can be passed from story to story. There are also two iron chutes down which to slide packed cases, the chutes having an upward incline at the end to prevent jar at the termination of the journey. On the first story is a telephone exchange.

All of the four upper stories are devoted to the storage of full lines of general Hardware of almost every description. It may be said parenthetically that they also have a large new warehouse in another part of the city for storing full cases and Heavy Hardware. Iron, Steel and allied goods, especially those of a bulky nature.

All packing is done on the second floor, which is connected with the street by chutes, which, in effect, make it as convenient for packing purposes as though this space was a floor flush with the street. The chutes deliver the packed goods directly to the drays.

There are lunchrooms for men and women and complete toilet rooms on every story. A unique feature is the setting apart of a room for the filing of catalogues, storage of stationery, &c. There are also rooms specially fitted up for visiting merchants, where letters may be written and private business attended to.

The basement is constructed solidly of concrete, both floors and walls, in which a space has been reserved for the installation of an electric plant for their own use. If later it is found necessary, the present service being obtained from one of the electrical companies. In planning the building, provision has been made for the addition of another story or two whenever the interests of the business demand it in the future. Upward of 200 people are employed in the establishment. There are 35 commercial travelers representing the house all over the Pacific Slope, including Alaska and Mexico. They also do business with the Hawaiian Islands, Australia and the Orient. They are certainly to be congratulated on their new building, which not only in size and construction, but in convenience and equipment, ranks among the best in the country.

Keen & Hagerty Mfg. Company Absorbed by National Enameling & Stamping Company.

THE NATIONAL ENAMELING & STAMPING COMPANY have purchased the plant of the Keen & Hagerty Mfg. Company, Baltimore, Md., who are large manufacturers of Pieced and Polished, Stamped and Japanned Tinware, Galvanized Ware and Gray Flint Enameling Ware. The consummation of this transaction is regarded as giving the National Company a great advantage in Southern business, as they have thus

absorbed their only competitor in that section. Keen & Hagerty Mfg. Company had a capital stock of \$250,000 and employed about 500 men. Among the reasons assigned for going into the combination are inability to supply their own raw material and also the community of interests between the railroads, the effect of which has been to raise the classification of some products, thus increasing the cost of distribution, which is particularly onerous in supplying the more distant trade.

Death of William K. Woodwell.

WILLIAM K. WOODWELL, senior member of the hardware firm of Joseph Woodwell & Co., Pittsburgh, Pa., said to be the oldest established concern of this character in that city, died suddenly at the Herald Square Hotel in New York last week. Mr. Woodwell, who was well advanced in years, left Pittsburgh ten days before his death to obtain treatment for rheumatism in New York.

Wm. K. Woodwell was born in Pittsburgh in 1830 and was one of its oldest and most prominent citizens. He was the eldest son of Joseph Woodwell, who founded the business over 60 years ago, and who died a few years ago at the advanced age of 93. For over 50 years the deceased was associated with his father in the business. Joseph R. Woodwell, his brother, has been with the firm a number of years. Since the death of their father the two brothers composed the firm of Joseph Woodwell & Co. Mr. Woodwell's acquaintance was wide, and in his circle of friends and associates were many of the prominent business and professional men of the city. He is survived by four children, two of whom, W. E. and John Woodwell, are connected with the management of the business of the firm. W. K. Woodwell belonged to the Emory M. E. Church, was a member of Hallman Lodge of Free Masons, of Tancred Commandery, Knights Templar, a thirty-second degree Mason, and a member of Syria Temple, Ancient and Arabic Order of the Mystic Shrine.

The Pittsburgh Shovel Company.

AS noted some time since in these columns, the Pittsburgh Shovel Company have been organized at Pittsburgh, and have purchased the buildings of Jennings, Beale & Co., at West Leechburg, and will commence the manufacture of Shovels of all kinds about July 1. Contracts for most of the equipment have been placed, and delivery is now being made. The officials of the company are W. S. Horner, president; Geo. S. Phillips, vice-president; L. V. Walsh, treasurer. The capital stock of the company is \$100,000, which may be increased later when the plant is started.

Requests for Catalogues, &c.

Shively & Gue, Hardware merchants, 204 Smithfield street, Pittsburgh, would be pleased to receive catalogues from manufacturers of Hardware articles, particularly of Tools.

R. A. Zoeller & Co., Tarboro, N. C., have purchased the stock of Stoves, Tinware, China and General Household Goods of the late L. C. Terrell, and will add a stock of General Hardware. They will also do tinning and plumbing. The firm will be pleased to receive catalogues, price-lists, &c.

Harley Hardware Company will open up in business at Valdosta, Ga., about April 15. They expect to carry a line including general Hardware, Mill Supplies, Agricultural Implements, Sash, Doors, Blinds, Paints, Oils, &c., and will appreciate catalogues and price-lists pertaining thereto.

Ad. Ahlers, Whitley, near Newcastle-on-Tyne, England, makes a specialty of Walrus Leather in all thicknesses for polishing purposes. In his advertisement, which will be observed on another page, Mr. Ahlers invites the trade to communicate with him as to prices.

Thompson-Hoof Company.

THE Heavy Hardware house of Parkhurst & Wilkins, Chicago, established May 1, 1865, by Josiah J. Parkhurst, will be succeeded April 15 by the Thompson-Hoof Company. Mr. Parkhurst has been the active manager of the house ever since it was started, and therefore retires after 36 years of service, covering not only a long but eventful period. He retains an interest in the new ownership. He will devote his time hereafter to the La Porte Carriage Company of La Porte, Ind., a prosperous manufacturing establishment in which he is largely interested and whose business is rapidly growing. He will have an office in Chicago and will also represent other manufacturing interests. The Thompson-Hoof Company have been incorporated with a capital of \$115,000 by W. M. Thompson, John C. Hoof and Oscar F. Rydell. Mr. Hoof has long been identified with the Hardware trade of the Northwest through his connection with the house of Kelley, Maus & Co. His associates are experienced business men.

Trade Items.

STOVER MFG. COMPANY, Freeport, Ill., are now represented in New York by E. A. Grenzbach, 116 Beekman street. While giving attention to their complete line of goods, he is particularly introducing their New Idea Double Acting Spring Hinges for doors. An important feature of this Hinge is that it prevents the door from sagging. Architects are said to regard the Hinge favorably.

THE automobile show held in Chicago last week was so successful in every respect that the exhibitors have requested the managers to repeat it next spring.

THE CAMBRIA FOUNDRY & MACHINE COMPANY, Johnstown, Pa., are getting ready to make Shovels. A new building has about been finished and fitted up with necessary machinery, and the concern expect to turn out about 50 dozen Shovels per day. The company also make Castings and Specialties.

HARRY CASSADY has resigned his position as manager of the Milwaukee bicycle factory of the American Bicycle Company to become sales manager of two of the largest plants owned by the Automobile & Cycle Parts Company, Cleveland, Ohio, namely, the Smith Stampings factory in Milwaukee and the Thompson factory in Chicago. Mr. Cassady has complete charge of the latter establishment, which, by the way, makes Hardware Specialties of a variety little known to those who have come to look upon its products as confined exclusively to Cycle Parts. The making and marketing of Curling Irons, Nut Crackers, Metal Hat, Towel and Coat Racks, Tracing Wheels, Stove Pokers, Glove and Shoe Buttoners, and a long list of other specialties will occupy no small part of Mr. Cassady's time, but as his apprenticeship was spent at that kind of work—he was one of Hibbard, Spencer & Bartlett's salesmen before entering into the bicycle field—it will not be new to him. The Smith plant will be fully developed by Mr. Cassady. Already he has a tubular running gear for light horse drawn vehicles to market, and soon the factory will be making a running gear for Automobiles, Carriage Hubs—the shells and axles of which are of tubing and the cups, cones, nuts, bolts and caps of which are stamped—will also be put on the market. In marketing these new products, as well as the well-known line of Smith Cycle Stampings, the ability of Mr. Cassady will have full play.

THE BARNES MFG. COMPANY, Mansfield, Ohio, announce under date of March 15 the appointment of Browne & Frothingham, 32 Broadway, New York, as their sole export representatives, to whom all communications regarding foreign business should be addressed. The company are now at work on a new catalogue and price-list, which will be ready for distribution in about 30 days.

T. C. PROUTY COMPANY, manufacturers of Door Hangars, Midland, Mich., owing to the increase in their business in the Eastern States, have found it necessary to be in closer touch with their patrons. They have accord-

ingly opened a fully equipped branch office and sales-room at 81 and 83 Fulton street, New York.

ANNOUNCEMENT is made under date of April 1 that the wholesale Hardware and commission business of the late Chas. M. Ghriskey, 508 Commerce street, Philadelphia, will be continued by the estate of Chas. M. Ghriskey, Henry C. Ghriskey and Chas. M. Ghriskey, Jr., under the name of Chas. M. Ghriskey's Sons.

ENTERPRISE FOUNDRY & FENCE COMPANY, incorporated, have succeeded Ellis & Helfenberger, Indianapolis, Ind., and will continue the business under the same management as heretofore. Wm. Helfenberger is president of the company, and Geo. R. Ellis, secretary and treasurer.

CLEVELAND GALVANIZING WORKS, Cleveland, Ohio, in a page advertisement in this issue call attention to their manufactures, including Pump Chain, Rubber Pump Buckets, White Metal Pattern Letters and Figures, which they commenced to make about a year and a half ago and have sold all over the United States and Canada; Lightning Rod Braces and Fixtures, and the Standard Butter Cutter, lately introduced, for cutting tub butter into $\frac{1}{2}$, 1 or 2 pound bricks or prints. The company advise us that the sales on these specialties are most satisfactory and ahead of former years. They also do general galvanizing and can furnish Castings, galvanized, complete. They are also equipped with tools and machinery for the manufacture of specialties, small parts, &c., on contract.

Price-Lists, Circulars, &c.

NATIONAL SWEEPER COMPANY, Marion, Ind.: Illustrated folder describing the Marion, Monarch and Perpetual Carpet Sweepers, and the Marion and Monarch Clothes Wringers. The circular also illustrates a display stand, having racks for six Carpet Sweepers, which is specially designed for the display of the company's line of goods.

THE MARION MACHINE & TOOL COMPANY, Marion, Ind.: Illustrated circulars calling attention to the Reynolds Tire Bolting Machine, which is a combination bolt clipper, bolt wrench and tire bolt holder. This machine is designed for the special use of manufacturers and repairers of vehicles.

THE FOLDING PAPER BOX COMPANY, South Bend, Ind.: Folder illustrating Cabinets for office use in filing catalogues and other documents by the Brownfield filing system. The features of this system are described and six styles of Cabinets are illustrated and priced.

JENKINS BROS., 71 John street, New York: 1901 catalogue relating to their well-known line of Jenkins Bros. Valves, Jenkins Disks, Jenkins Standard Packing, &c.

JOHN STORTZ & SON, Philadelphia, Pa.: Catalogue of 52 pages devoted to their line of Plumbers', Tinnery, Roofers' and kindred Mechanics' Tools.

THE HARRY UNNA COMPANY, San Francisco, Cal.: Spring catalogue and price-list of Shelf Hardware.

PACKARD HARDWARE COMPANY, Greenville, Pa.: Illustrated price-list of Guns, Revolvers, Ammunition, &c.

MCKINNON DASH COMPANY, Buffalo, N. Y.: An attractively printed catalogue of more than 100 pages, illustrating their well-known line of Dashes, Fenders, Roll Up Straps, Prop Block Washers and Shaft Leathers. The company's factories are at Buffalo and Syracuse, N. Y.; Cincinnati and Troy, Ohio, and St. Catharines, Ont.

SEYMOUR SMITH & SON, Oakville, Conn.: Illustrated catalogue and price-list relating to Pruning Shears of different patterns, Standard Tree Pruner, Bull Rings and Cattle Leaders, Saw Sets, Bench Hooks, Iron Spoke Shaves and Carpet Stretchers. The catalogue gives information for the benefit of export buyers as to weights and measurements.

SIMMONS HARDWARE COMPANY, St. Louis, Mo.: Two catalogues devoted to Brass and Iron Beds, Reed Furniture, Tables, Tabourettes, Refrigerators, Lawn Furniture, Hammocks, Baby Carriages, Ice Cream Freezers, &c. A smaller catalogue is entitled "Harness and Harness Goods."

THE UNION HARDWARE COMPANY, Torrington, Conn.; New York office, 95 Chambers street, in charge of Tower & Lyon: Thirty-eight page illustrated catalogue of Gun Implements, including Loaders and Decappers, Closers, Recappers, Extractors, Measures, Cleaning Implements and Rods, Loading and Cleaning Sets, Whistles, Calls, Loading Appliances, &c. Especial attention is called to a new Reverse Head Closer and the Hartness Gun Cleaner.

CHICAGO FLEXIBLE SHAFT COMPANY, La Salle avenue and Ontario street, Chicago, Ill., for whom Allerton-Clarke Company, 97 Chambers street, New York, are Eastern selling agents: Illustrated catalogue of Sheep Shearing Machines, 12 of the 32 large pages giving photographic illustrations of the various proper positions in which to hold sheep when shearing them in record time, with accompanying descriptive matter for the information of sheep shearers.

SARGENT & Co., New Haven, Conn., and 149-153 Leonard street, New York: Revised list prices on Bright Wire Goods adopted April 1. The new list on these goods is given on another page.

WITHINGTON & COOLEY MFG. COMPANY, Jackson, Mich.: A booklet gotten up for distribution to consumers through the retail dealers and intended to show the uses and qualities of their extensive line of Steel Goods. It is attractively printed and tells its story admirably.

DEKALB FENCE COMPANY, DeKalb, Ill.: Pamphlet entitled "Fence Facts and Figures," in which reference is made to their ornamental Strip and Steel Wire Fence Board, Steel Web Picket Fence, Field and Hog Fencing and M. M. S. Poultry Fencing.

IOWA FARMING TOOL COMPANY, Fort Madison, Iowa: The company are directing frequent attention of the trade to their manufactures in the Steel Goods line through the medium of circulars, leaflets, blotters, &c. Several just at hand relate to Columbia Socket Hay, Manure and Spading Forks, and the Victor braced shank Hay, Manure and Header Forks.

J. A. DAILEY, Detroit, Mich: Illustrated descriptive catalogue No. 3 of Steam, Water and Gas Specialties, including Air, Gas, Cylinder and Special Cocks, Radiator Air Valves, Gas Stove Valves, Hose End, Hydrant, Straight and Pillar Cocks, Nipples, Mixers, Mixer Pins and other goods of this character.

Clark, Horrocks & Co.

CLARK, HORROCKS & CO., Utica, N. Y., have issued a catalogue of 140 pages, in which they illustrate the line of Fishing Rods of which they are manufacturers, and also high grade Fishing Tackle. Their process of manufacturing the Rods is illustrated and described. They also make special Rods to order of any style or pattern. Attention is called to the Oil Silk and Water Proof Lines for which they are general selling agents for the manufacturer. A copy of the catalogue will be sent to any Hardware or Sporting Goods dealer on application. The catalogue is accompanied by a pamphlet giving net trade prices.

Miscellaneous Notes.

Bridgeport Mfg. Company.

Bridgeport Mfg. Company, Bridgeport, Conn., have added several new patterns to their line of shears. One of these is the Waldorf straight trimmer in full nickel plated or nickel plated blades and black enameled handles. These shears are referred to as made from the finest quality of steel faces welded to malleable backs and are fully warranted. Other patterns are the Argyle, full nickel plated, and Bent trimmers, Ideal, full nickel plated, and Blue Bell, nickel plated blades and blue enameled handles. The latter have special brass bolt, nut and washer, each shear in anti-rust pocket. The company expect shortly to be in position to supply a full line of Bent trimmers, barbers', bankers', &c. They have also enlarged their line of screw drivers, pliers and wire cutters and are prepared to execute large contracts

for anything in the line of metal goods. New catalogues will be ready in a few weeks.

Cleveland Wire Spring Company.

Cleveland Wire Spring Company, Cleveland, Ohio, are putting on the market the Iron Clad steel shop boxes, which are made from a single piece of sheet steel, with a triple reinforcing fold on the upper edges, the sides lapping around on the corners, thereby making a continuous band around the top sides and corners of the box. They are provided with strong handles and a hole at each end for hook insertion, for moving them around. The durability, strength and stiffness of these boxes are referred to as enabling them to withstand the rough handling steel shop boxes are usually subjected to. Their Iron Clad taper steel shop boxes are made and finished exactly the same as their Iron Clad plain bottom steel shop box, except that the sides and ends are made tapering, so that they will nest closely, taking up but little space when not in use. They also make boxes similar to the above, but folded, from one piece of metal, without cutting, making an absolutely oil tight box. These boxes are made in any size desired. A line of two man steel hand barrows is also made in the same manner as their Iron Clad steel shop boxes, except that they dispense with handles and holes at end of body and attach wooden handles to two sides. The company will be pleased to furnish catalogues representing their line to any desiring them.

Plow Shares, &c.

Havana Metal Wheel Company, Havana, Ill., who are manufacturers of steel wagons, steel wheels, feed grinders and steel wheelbarrows, have lately added a department to their plant expressly for the manufacture of plow shapes. Ever Ready plow shares, landsides, bars, cultivator shovels and plow points. With their facilities they state that they are in position to furnish goods of first-class quality in crucible and soft center steel at right prices in any quantity.

The Sterling Wrench.

Frank Mossberg Company, Attleboro, Mass., have added to their line of wrenches the Sterling, which is illustrated in their advertisement on another page of this issue. The wrench is referred to as carefully made, case hardened, nickel plated and very highly finished. They also make it without nickel. The strength of this wrench, considering its light weight, is especially emphasized. It is offered at a medium price. The length of the wrench is 5 inches, and its weight 4½ ounces.

Union Metallic Cartridge Company.

Union Metallic Cartridge Company, Bridgeport, Conn., and 313-315 Broadway, New York, are putting on the market a .22 short smokeless cartridge. While this cartridge has been on the market for years, the new characteristic of it is the powder with which it is loaded. The experimentation with this cartridge to get just the right sort of powder and have the shell properly loaded has resulted in what they refer to as a perfect cartridge for target practice in galleries or at an improvised range. The new U. M. C. .22 Smokeless is especially adapted for this work, as there is but little noise, no wild bullets, no smoke or particles of burning powder dropping from the end of the rifle. This ammunition will be packed in boxes of 50 and 100 count, containing a standard target in whose bull's-eye there is a record of the extreme accuracy of the new .22.

Camping Outfits.

David T. Abercrombie & Co., 2-3 South street, New York, make a specialty of supplying the wants of sportsmen, explorers and travelers in the way of outfits and goods of this general character. Since the establishment of this business in 1892 it has been their endeavor to keep pace with the growing popularity of living outdoors. Originally they made tents of the usual stuffs, which have been improved on by using additional materials for making all styles of tents. These include a

special water proof cotton fabric and a water proof balloon silk, both of which are extremely light and strong. Outfits of this character are now used by expeditions under Government, university and private control. In a catalogue of 56 pages, just issued, a large number of goods for campers are illustrated and described, including aluminum cooking outfits, stoves that fold, aluminum ovens, camp furniture, tables and hanging shelves that fold or roll. There are also mattresses and cushions, clothing and provision bags, feed bags, pack harness, folding buckets and basins, Primus oil burner and utensils, Pantasote water proof clothing, sleeping bags, Pontiac knitted clothing, moccasins,

Pattern Makers' Spoke Shave.

Goodell-Pratt Company, Greenfield, Mass., are putting on the market the pattern makers' spoke shave, catalogued No. 36, shown herewith. It is referred to as designed and constructed with special regard to the wants of the pattern maker, and the design and form of the tool are said to be the result of years of experience. The frame is of iron, so shaped, it is remarked, as to fit the hand of the operator and be evenly balanced, making delicacy of touch possible. The blade has a back and forward adjustment, being made, it is stated, as well as it is possible to make a blade of this charac-



Pattern Makers' Spoke Shave.

lanterns, hunting knives, yacht furnishings and paulins for every purpose. They also make a feature of evaporated vegetables, which are only one-tenth the weight of fresh vegetables.

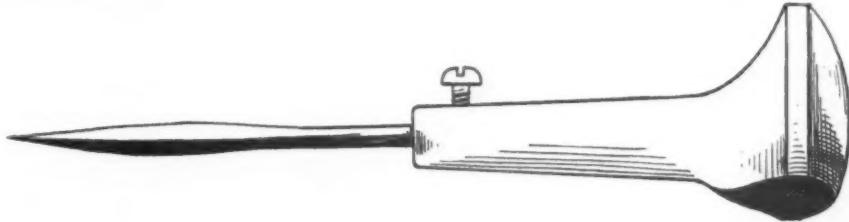
Port Huron Mfg. Company.

The Port Huron Mfg. Company, Port Huron, Mich., have recently added to their products the manufacture of circular saws. They are now making all sizes of solid tooth circular saws, either rip or cut off, and shingle and heading saws. The company state that for the manufacture of saws they purchase the best saw steel and grind them perfectly true on a special machine, insuring uniform thickness throughout the circumference at any distance from the center of the saw. Every saw is thoroughly balanced, tested to its given

ter. It is 2 inches wide, and the whole tool is 9 inches in length. The frame is finished in japan; the blade is polished, and the thumb nuts are nickel plated.

The Twentieth Century Ice Pick.

The accompanying illustration represents an ice pick offered by the Twentieth Century Mfg. Company, Goshen, Ind. The pick is all of metal, consisting of a cast iron handle drilled to receive a steel point, which is secured in the handle by means of a set screw. The handle is oval on the top, to fit into the palm of the hand, with a flat surface on one side to prevent the pick rolling when laid down. The tool is so shaped, it is explained, that a quick, downward blow may easily be given, driving the sharp steel point into the ice. The



The Twentieth Century Ice Pick.

rate of speed, and nicely polished. The company are preparing to manufacture inserted tooth saws.

Pocket Knife Cases.

Edwin A. Cauter, 147 West Broadway, New York, manufacturer of leather goods for the hardware and cutlery trade, has recently put on the market a new pocket knife case which has some distinctive features. It is made of a tan colored leather guaranteed not to tarnish or rust the metal portions or scales of the knife, and so made that the inner button will not scratch the most delicately constructed knife. The case, which is made of two pieces of leather, is glove stitched and has a flap that covers the open end and fastens with a two piece metallic button. One side of the case is so made that the inner flap can be turned inward so as to cover

manufacturers remark that experience has demonstrated that this sharp point will split up ice, whether in large cake or a small piece, much more readily than if hatchet shaped, and that the weight of the iron handle, which is 7 ounces, together with the sharpness of the point, enables the user of the pick to do a large amount of work with a comparatively small amount of exertion. The temper of the steel point and the proper shape, we are advised, are the result of much experimenting. The pick is referred to as being equally effective on ice wagons and in the kitchen for shaping and breaking ice without waste.

The Cronk Grape Shear.

The Cronk Hanger Company, Elmira, N. Y., are introducing the grape shear herewith shown. It is re-



The Cronk Grape Shear.

the inside of the metal button, thus protecting the scales of fine knives, especially those finished with gold, silver, pearl, tortoise and ivory, from injury. They are made in four sizes: No. 0, 3 inches; No. 1, 3 1/4 inches; No. 2, 3 1/2 inches, and No. 3, 4 inches long.

ferred to as being made of a high grade steel, firmly tempered, and first class in every particular. It is designed for picking grapes and for culling. Attention is directed to the absence of parts which might catch or pinch the hand of the operator.

The Eagle Mop Wringer.

The Eagle Cooperage Works, Circleville, Ohio, are offering the mop wringer here shown. The wringing device is attached to a substantial white cedar pail hooped with electric welded hoops. In operation, one foot is placed on the foot holder to hold the bucket stationary. The mop is placed between the rollers and the lever is pressed down with the other foot to bring the rolls together. It is explained that it is not necessary to touch the mop except to hold it by the handle, which

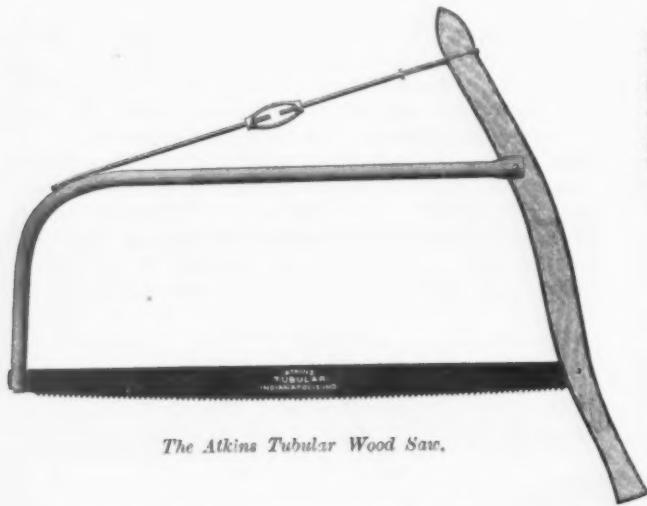


The Eagle Mop Wringer.

is pulled straight up to wring out the water. The wringer is constructed upon the principle, it is shown, that the cords of the mop will not become entangled with the springs, guide plates or any other working parts. The manufacturers allude to the wringer as having all parts made of the best materials to secure strength and rigidity.

The Atkins Tubular Wood Saw.

The accompanying illustration represents a steel frame buck saw offered by E. C. Atkins & Co., Indianapolis, Ind. The frame consists of a wood handle, to which is attached the tubular metal portion of the frame. It is triangularly braced, which is referred to as making not only a stiffer frame when tight, but as preventing any see-saw motion in the joints of the frame. Among the additional points of excellence al-



The Atkins Tubular Wood Saw.

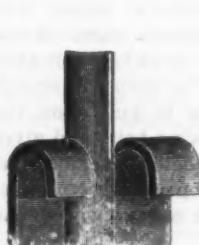
luded to by the manufacturers are the following: That this style of frame saves repairs, in not only that it has but one wooden piece to warp and break, but it is unnecessary to overstrain the rod to tighten the blade; that there is but one pivot, and that is placed with a decided advantage toward leverage; that the frame is not top heavy and the weight is thrown forward upon the teeth of the blade; that the frame is as light as one made of all wood; that it will not warp, will stand hard usage and that it will save its cost in repairs in a few years.

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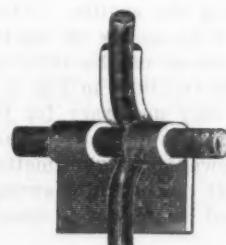
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The Anchor Fence Clamps.

In Fig. 1 is shown fence clamps and in Fig. 2 the finished fence offered by the Missouri Anchor Fence Company, St. Joseph, Mo. The clamps are designed for use by farmers, railroads or any one using wire fencing, for clamping the running and the upright wires or stays at their intersections. The clamps may be applied to new fences, either barb or smooth wire; also for repairing



Before Closing.



After Closing.

Fig. 1.—Anchor Fence Clamps.

old fences of either kind of wire. A small and comparatively inexpensive tool, weighing 6 pounds, and durable enough, it is stated, for building 30,000 rods of fence, is used for putting on the clamps. They are sold by the thousand and by the pound, and enable fence builders, it is remarked, to construct durable fence and to fit the ground over which the fence is erected. The makers allude to the fact that one man and a boy can clamp up,

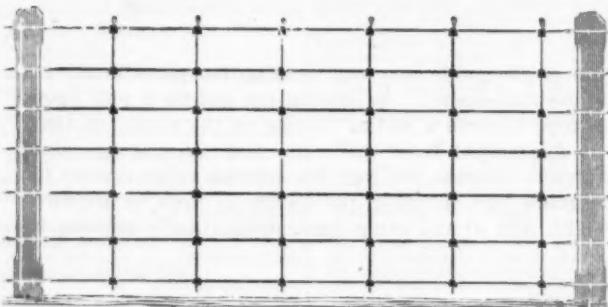


Fig. 2.—The Anchor Fence.

with five to seven clamps to the rod, from 60 to 80 rods of fence in ten hours. By the use of clamps it is shown that all running wires are kept from coming down to the ground, thus preventing stock getting tangled up in the fence. The company also manufacture the fence shown in Fig. 2.

The Enterprise Cherry Stoner.

The Enterprise Mfg. Company, Philadelphia, Pa., are putting on the market a new cherry stoner, shown in the accompanying cut. It is constructed with a patented



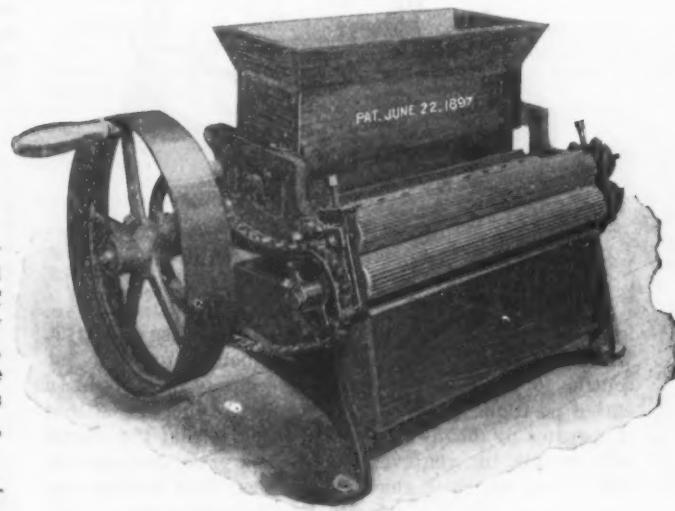
The Enterprise Cherry Stoner.

regulating device, the simplicity of which, it is remarked, makes it easy to adjust the machine for the different sizes of cherries, and insures the jaws retaining their

position when set. The stoners are recommended by the manufacturers for rapid and effective work.

Pea Sheller.

George H. Olney, 163 Herkimer street, Brooklyn, N. Y., is the manufacturer of the pea sheller here illustrated. It is suitable for restaurant, hotel and club use. It is particularly intended for grocery stores, to do for customers purchasing a measure of peas in the pod, what the coffee mill does for buyers of coffee—i. e., shell the vegetable while they wait. It has a hopper of wood which is hinged on the back so that the working parts



Pea Sheller for Hand or Belt Power.

can be readily cleaned if necessary. Peas are fed into the hopper and shelled at the rate of a peck in 15 minutes, the machine being arranged for hand or belt power. The sheller occupies a space of 18 x 19 inches, weighs 18 pounds, and has a driving wheel 10 inches in diameter. In operation the peas fall into the closed drawer below while the pods drop outside. The corrugated rolls between which the pods pass are adjustable for the large peas which usually come early in the season, or the smaller second growth peas gathered in the fall.

Ideal Bullet No. 285228.

The Ideal Mfg. Company, New Haven, Conn., are prepared to furnish molds for the bullet shown in the accompanying cut. The bullet is designed for use in the .28 caliber Stevens and Pope's rifles, and it is also the proper diameter, it is stated, for the 7-mm. Spanish



Ideal Bullet No. 285228.

Mauser rifles. Many of the 7-mm. rifles were purchased as relics at the close of the Spanish war, and many of them have proved accurate, but, it is explained, altogether too powerful for use on small game near settlements. The bullet illustrated, it is remarked, will be found accurate for the range of 150 yards and under, when using low pressure smokeless powders. The hole in the point of the bullet is to cause it to expand and mushroom, to make it a killer. The first three figures—285—designate the standard diameter of bullets for the arms before mentioned. The company can also furnish molds for round bullets of the same diameter, for use at extra short range and for indoor practice.

Bickelhaupt's Automatic Scuttle Lifter.

The accompanying illustrations relate to an automatic scuttle lifter, offered by the G. Bickelhaupt Skylight Works, 243-245 West Forty-seventh street, New York. The lifter is constructed so as to permit a person stand-

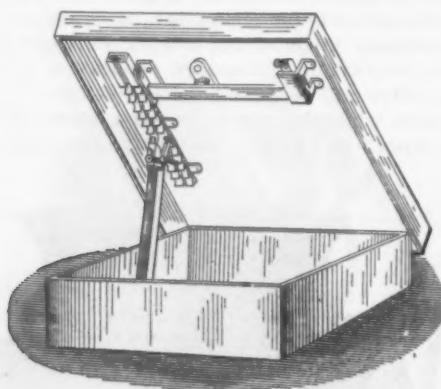


Fig. 1—Bickelhaupt's Scuttle Lifter.

ing on the floor below to readily open or close a scuttle, while the arrangement of parts is such as to cause the scuttle to be automatically and securely locked in a closed position. A special feature of the device is that it operates by means of a single rope and that the scuttle will remain in whatever position may be desired. In Fig. 1 the device is shown as applied to a scuttle partially open. The full lines in Fig. 2 indicate the scuttle closed; the dotted lines show the position of the mechanism when partially open. Fig. 3 represents the bolt thrown back and the parts in position for opening the scuttle. The scuttle is hinged to the curb or opening in

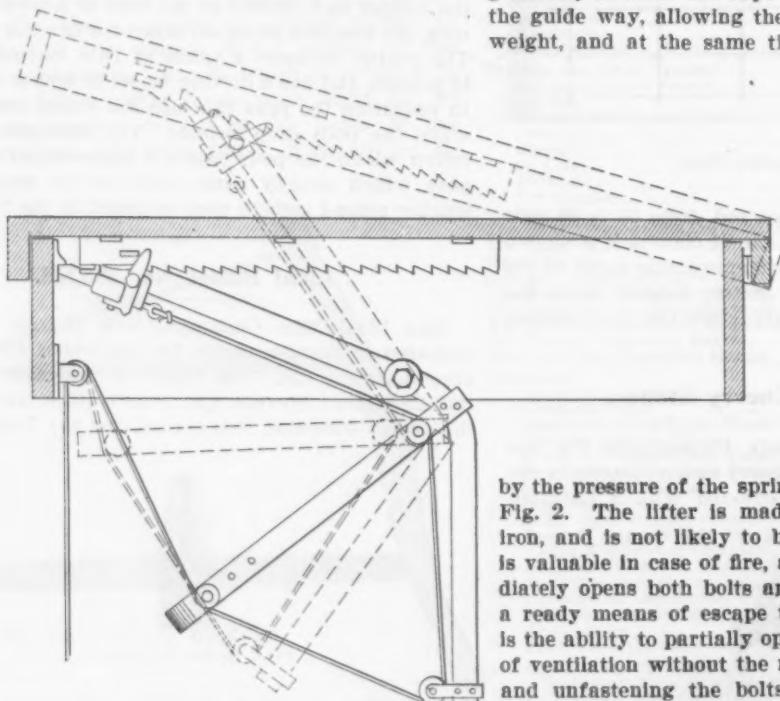


Fig. 2.—Sectional View, Showing Details of the Lifter.

the roof, and on the underside is secured a slotted guide way provided with teeth or notches, as indicated in Figs. 1 and 2. In this guide way is a friction roller secured to the forward end of the lever or angled arm, as shown in Fig. 3. On the front end of the lever, which is pivoted to the side of the curb, as indicated in Fig. 2, is also a bolt, which engages the teeth of the guide way and holds the lever locked to it while supporting the scuttle in an open position, as indicated in Fig. 1, and by means of

the dotted lines in Fig. 2. When the scuttle is in a closed position it is securely locked by the bolt on the front end of the lever already mentioned, and also by the catch at the end of the arm extending to the right in the upper part of Fig. 1. Attached to the first named bolt is a rope, by means of which the operator opens and closes the scuttle. The course of the rope is clearly indicated in Fig. 2, while a detail of the locking mechanism is shown in Fig. 3, the bolt being drawn back ready for opening the scuttle. When the scuttle is closed and locked by means of the bolts the various parts of the mechanism of the lifter are in the position indicated by the full lines in Fig. 2. In order to open the scuttle it is only necessary for the operator to pull upon the rope, which instantly releases the locking bolts and gives an upward swinging motion to the angled lever or arm, so that the scuttle is swung into an open position, as indicated by the dotted lines, the catch engaging with the

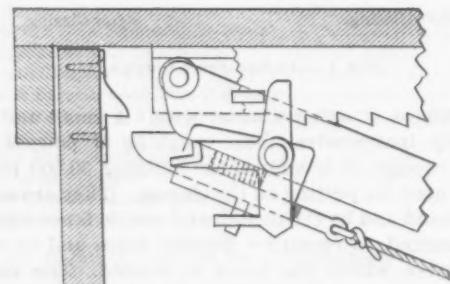


Fig. 3.—Bolt or Latch of Lifter Thrown Back.

teeth of the guide way and holding the parts firmly in the position desired. In closing the scuttle a pull upon the rope imparts a sliding motion to the catch, so that it is disengaged from the teeth, and as the operator gradually releases the rope the friction roller travels in the guide way, allowing the scuttle to close by its own weight, and at the same time automatically locking it

by the pressure of the spring upon the bolt, as shown in Fig. 2. The lifter is made of wrought and malleable iron, and is not likely to break or get out of order. It is valuable in case of fire, as one pull on the rope immediately opens both bolts and scuttle, thereby furnishing a ready means of escape to the roof. Another feature is the ability to partially open the scuttle for the purpose of ventilation without the necessity of climbing a ladder and unfastening the bolts. The device is such, it is stated, that it can be readily applied to scuttles already in use at a limited expense.

Sugg & Lauderdale, Dyersburg, Tenn., have been improving their store by the introduction of Warren's patent glass front shelving and rolling ladders. They are also building a two-story warehouse and enlarging their stock in anticipation of increased trade.

William Brinkmann's Sons, 2615 Frankford avenue, Philadelphia, Pa., have dissolved, and the business will hereafter be conducted under the style of Brinkmann Bros.

Carpet Stretchers—

See Stretchers, Carpet.

Cartridges—

B. B. Caps, Con., Ball Swg.	\$1.90
B. B. Caps, Round Ball	\$1.15@1.18
Blank Cartridges:	
38 C. F., \$5.50	10d@5%
38 C. F., \$7.00	10d@5%
22 cal. Rim, \$1.50	10d@5%
32 cal. Rim, \$2.75	10d@5%
Central Fire	25%
Pistol and Rifle	15d@5%
Primed S'ells and Bullets	16d@5%
Rim Fire Sporting	50%
Rim Fire, Military	16d@5%

Casters—

Bed	70@70d@10%
Plate	75@75d@10%
Philadelphia	75@75d@10%
Boss	70@10%
Boss Anti-Friction	70@10%
Martin's Patent (Phoenix)	45%
Payson's Anti-Friction	70@10@10%
Standard Ball Bearing	45%
Tucker's Patent, low list	80%

Cattle Leaders—

See Leaders, Cattle.

Chain—

American Coil, Less than Cages:	
3 16 " 6-16 " 4 " 7-16 " 5 " 9-16 "	3 16
7 50 " 6-50 " 3 5 " 3 40 " 3 30 " 3 25 "	7 50
3 25 " 3 20 " 3 16 " 3 14 " 3 10 " 3 8 " 3 5 " 3 25 "	3 25
Cask lots deduct 25% per 100 lbs.	
German Coll. list July 26, '97. 60@10d@10%	
German Halter Chain, list July 26, '97. 60@10d@10%	
Traces, Western Standard: 100 pair	
6 1/2-3, Straight, with ring. 50@50.00	
6 1/2-4, Straight, with ring. 52@7.00	
6 1/2-5, Straight, with ring. 53@1.00	
6 1/2-6-2, Straight, with ring. 55@5.50	
Add 2¢ per pair for Hooks.	
Twist Traces 2¢ per pair higher than Straight Link.	

Trace, Wagon and Fancy Chains.	
Eastern list. 60@60d@5%	
Jack Chain, list July 10, '93:	
Iron. 60@60d@10%	
Brass. 60@60d@10%	
Safety Chain. 70@70d@10%	
Gal. Pump Chain. 1b 4 1/2@4 1/2	
Covert Sad. Works:	
Breast, Hitching and Rein Chains. 50¢	
Cover Mfg. Co.:	
Brass. 35@2%	
Halter. 35@2%	
Hoist. 35@2%	
Kein. 35@2%	
Stallion. 35@3%	
Oneida Community:	
Eureka Coll and Halter. 50@40d@5%	
Niagara Coll and Halter. 60@60d@5%	
Niagara Cow Ties. 45@5@45@10@5%	
Am. Coll and Halters. 50@10d@60%	
Am. Cow Ties. 35@40d@5%	
Wire Goods Co.:	
Dog Chain. 60@10%	
Universal Dbl-Jointed Chain. 50%	

Chalk Lines—See Lines.**Checks, Door—**

Barclay's. 40@10%
Columbia. 50@10%
Eclipse. 60@60d@10%

Chests, Tool—

American Tool Chest Co.:	
Boys' Chests with Tools. 50%	
Youths' Chests with Tools. 45%	
Gentlemen's Chests with Tools. 35%	
Farmer's, Carpenters', etc., Chests with Tools. 30%	
Machinists' and Pipe Fitters' Chests, Empty. 50%	
C. E. Jennings & Co.'s Machinists' Tool Chests. 30%	

Chisels—

Socket Framing and Firmer Standard List. 70d@75d@5%
Buck Bros. 30%
Charles Buck. 30%
C. E. Jennings & Co. No. 191, 181. 25%
L. & J. White, Tanged. 35@2%

Cold—

Cold Chisels, good quality. lb. 14@15c
Cold Chisels, fair quality. lb. 12c
Cold Chisels, ordinary. lb. 8@9c

Chucks—

Beach Pat. each \$8.00. 30%	
M. & S. P. & M. Milling. 15@20%	
Skinner Patent Chucks. 40%	
Combination Lathe Chucks. 40%	
Drill Chucks, Patent and Standard. 30%	
Drill Chucks, New Model. 2 1/2	
Independent Lathe Chucks. 40%	
Improved Planer Chucks. 20%	
Universal Lathe Chucks. 40%	
Face Plate Jaws. 35%	
Standard Tool Co.:	
Improved Drill Chuck. 45%	
Union Mfg. Co.:	
Combination. 40%	
Czar Drill. 30%	
Geared Scroll. 40%	
Independent. 40%	
Union Drill. 40%	
Universal. 40%	
Face Plate Jaws. 35%	

Clamps—

Adjustable Hammers'. 30@20d@5%
Cabinet, Sargent's. 50@10%
Carriage Makers' P. S. & W. Co. 40@10%
Sargent Makers' Sargent's. 50@10%
Spear, Parallel. 33d@10%
Linenens, Utica Drop Forges & Tool Co. 40%
Saw Clamps, see Plies, Saw Plies.

Cleaners Walk—

Star Socket, All Steel. 50¢ per doz. \$4.00 net
Shank, All Steel. 50¢ per doz. \$3.75 net
W. & C. Sargent, All Steel. 74 in. 50¢ per doz. \$3.50; 8 in. \$3.40; 8 1/2 in. \$3.50.

Cleavers, Butchers'—

Poster Bros. 30%
New Haven Edge Tool Co. 40@10%
Fayette R. Plumb. 33d@10@10%
P. S. & W. 33d@10@10%
L. & J. White. 33d@10@10%

Clips Axe—

Eagle and Superior 4 and 5-1/2 inch. 70d@10%
Home Way, 3 1/2 and 5-1/2 inch. 70d@10%

Cloth and Netting, Wire

—See Wire, &c.

Cocks, Brass—

Hardware list (Globe, Kerossen, Racking, &c.). 65@10%
Brass, Pope & Stevens' list. 40%

Compasses, Dividers, &c.—

Emerson's. 70d@10@10%
Bemis & Call Hdw. & Tool Co. 65%

Dividers, Dividers, &c.—

Dividers. 65%
Calipers, Call's Patent Inside. 65%

Calipers, Double—

Calipers, Inside or Outside. 65%
Calipers, Wing. 60%

Compasses—

Compasses. 50%
Dividers. 50%

Conductor Pipe, Galvanized—

L. C. L. to Dealers:

Not nested. Nested.
Eastern. 70d@14%

Central. 70d@5%
Southern. 70d@2%

S. Western. 70d@3%
Terms. 25¢ for cash.

Coolers, Water—

Nest. 25¢ for cash.
See also Troughs.

Cord—Sash—

Cord. 25¢
Braided, White, Common. 1b 17/4@18c

Cable Laid Italian. 1b. 1/2@18c; B. 1/2@16c
Common India. 1b. 1/2@18c

Common India. 1b. 1/2@18c
Patent Russia. 1b. 1/2@18c

Cable Laid Russia. 1b. 1/2@18c
Patent Russia. 1b. 1/2@18c

Cable Laid Russia. 1b. 1/2@18c
Cable Laid India. 1b. 1/2@18c

Cable Laid India. 1b. 1/2@18c
Patent India. 1b. 1/2@18c

India Hemp. 1b. 1/2@18c
Patent India. 1b. 1/2@18c

India Hemp. 1b. 1/2@18c
Patent India. 1b. 1/2@18c

Patent India. 1b. 1/2@18c
Pearl Braided, cotton. 1b. 1/2@18c

Massachusetts, White. 1b. 1/2@18c
Massachusetts, D. A. 1b. 1/2@18c

Massachusetts, D. A. 1b. 1/2@18c
Eddystone Braided, cotton. 1b. 1/2@18c

<tr

Wire, Brown & Sharpe's.....	253	Barn Door, New England Pattern, Check Back, Round Groove, Regular:	
Wire, Morse's.....	253	Inch.....	3 4 5 6
Wire, F. S. & W. Co.	10&10x5	Doz.....	\$1.45 1.91 2.55 3.10
Gimlets		Chicago Spring Butt Co.:	
Nail, Metal, Assorted, gro. \$1.40@1.75		Fiction.....	25%
Spike, Metal, Assorted, gro. \$3.00@3.50		Oscillating.....	25%
Nail, Wood Handled, Assorted.		Blk Twin.....	25%
gro. \$4.00@4.25		Chisholm & Moore Mfg. Co.:	
Spike, Wood Handled, Assorted		Baggage Car Door.....	50%
gro. \$5.00@5.25		Elevator.....	40%
Glass, American Window		Railroad.....	55%
Jobbers' List, Sept. 1, 1900.		Cronk Hanger Co.:	
Small lots from store:		Loos Axle.....	60%
Single and Double Strength, all sizes.....	35&5	Roll F Bearing.....	60&10%
10% to be added on all first quality, both Single and Double.		Lane Bros.:	
Glue-Liquid, Fish-		Parlor, Ball Bearing.....	64.00
List A, Bottles or Cans, with Brush.	37 1/4@50%	Parlor, Standard.....	64.25
List B, Cans (4 pts., pts., qts.).....	35 1/4@45%	Parlor, New Model.....	64.75
List C, Cans (3 gal., gal.).....	25@45%	Parlor New hampton.....	64.40
Glue Pots —See Pots, Glue.		Barn Door, Standard.....	60&10%
Grease, Axle-		Covered.....	50&10&10x5%
Common Grade.....	gro. \$5.00@6.00	Special.....	60&10x10
Dixon's Everlasting.....	10-lb pails, ea. 85¢	Lawrence Bros.:	
Dixon's Everlasting, in bxs.	Doz. 1 lb \$1.30; 2 lb \$2.00	Advance.....	60%
Grindstone Fixtures		Cleveland.....	60%
See Fixtures, Grindstone.		Crown.....	60%
Guards, Snow-		New York.....	60%
Cleveland Wire Spring Co.:		Pe-riss.....	60&10%
Galv. Steel @ 1000.....	\$18.00	Sterling.....	60%
Copper @ 1000.....	\$18.00	McKinney Mfg. Co.:	
Gun Powder —See Powder.		No. 9, Standard.....	60&10x5
Hack Saws —See Saws.		No. 1, Special.....	60&10x5
Hafts, Awl-	gro.	Stowell Mfg. and Foundry Co.:	
Peg Patent, Leather Top.....	\$1.90@5.25	Acme Parlor Ball Bearing.....	40%
Peg Patent, Plain Top.....	\$3.50@3.75	Atlas.....	50&10x5
Sewing, Brass Ferrule.....	\$1.50@1.60	Badge Barn Door.....	50%
Saddlers', Brass Ferrule.....	\$1.35@1.45	Baggage Car Door.....	50%
Peg, Common.....	\$1.25@1.35	Elevator.....	50%
Brad, Common.....	\$1.50@1.75	Ind. State.....	50&10x5
Halters and Ties-		Ind. State Parlor Door.....	50%
Covert Mfg. Co., Web.....	45&25	Nansen.....	50&10x5
Covert Mfg. Co., Jute Rope.....	45&25	Parlor Door.....	50%
Covert Mfg. Co., Sisal Rope.....	30&25	Railroad.....	50%
Covert's Saddlery Works*, 98 list, W. b.	60&10x5	Street Car Door.....	50%
Covert's Saddlery Works, Leather 0@10		Steel, Nos. 300, 404, 500.....	40&5%
Covert's Saddlery Works, Jute.....	60&25	Wild West.....	50%
Covert's Saddlery Works, Sisal.....	60%	Zenith for Wood Track.....	60%
Covert's Saddlery Works, Manila.....	60&25	Taylor & Boggs Foundry Co.:	
Covert's Saddlery Works, Cotton.	70%	Kidder's.....	50&50&10%
Hammers —		Van Wagoner & Williams Hdw. Co.:	
Handled Hammers —		American Trackless.....	33 1/2&19%
Heller's Machinists'.....	50@50&25	Wilcox Mfg. Co.:	
Heller's Harnesses.....	50@50&25	Bike Roller Bearing.....	60&10%
Magnetic Tack, Nos. 1, 2, 3, \$1.35@1.50		O. J. Roller Bearing.....	60&10%
81.75.....		Cycle Ball Bearing.....	50%
Peck, Stow & Wilcox.....	40@40&10%	Dwarf Ball Bearing.....	40%
Fayette R. Plum:		Ives, Wood Track.....	60&10%
Plumb, A. E. Nail.....	40@10@50%	L. T. Roller Bearing.....	60&10x5
Engineers' and B. S. Hand		New Era Roller Bearing.....	50&10%
Machinists' Hammers.....	60@10&75%	O. K. Roller Bearing.....	60@10&25%
Riveting and Tinnors'.....	30@50@10%	Prindle, Wood Track.....	60%
Dargent's C. S. New List.....	45@10%	Richards' Wood Track.....	60%
Heavy Hammers and Sledges —		Richards' Steel Track.....	50@10%
3 lb. and under...lb. 15¢		Spencer Roller Bear.	60@10%
3 to 5 lb.....lb. 36¢	90@10@80	Tandem Nos. 1 and 2.....	60%
Over 5 lb.....lb. 30¢	10@10x5	Underwriters' Roller Bearing.....	40%
Wilkinson's Smiths'.....	35@10@100	Wilson Auditorium Ball Bearing.....	20%
Handcuffs and Leg Irons		Wilcox Barn Trolley No. 123.....	45%
See Police Goods.		Wilcox Fire Trolley, Roller Bearing.....	30%
Handles —		Wilcox Le Roy Noiseless Ball Bearing.....	40%
Agricultural Tool Handles —		Wilcox New Century.....	30@10x10
Axe, Pick, &c.....	50@60@10%	Wilcox Trolley Ball Bearing.....	40%
Hoe, Rake, Fork, &c.....	50@60@10%	Harness Menders —See Harness Menders	
Shovel, &c., Wood D Handle.....	50@50@5%	Hatches —	
Cross-Cut Saw Handles —		Best Brands.....	10@10@80%
Atkins'.....	40@55	Cheaper Brands.....	50@10@50@10@55
Champion.....	45@45@10%	Notes.—Net prices often made.	
Disston's.....	50%	Hay and Straw Knives —	
Mechanics' Tool Handles —		See Knives.	
Auger, assorted.....	gro. \$2.20@2.50	Hinges —	
Brad Awl.....	gro. \$1.25@1.50	Blind and Shutter Hinges—	
Chisel Handles :		Surface Gravity Locking Blind:	
Apple Tanged Firmer, gro. ass'd. \$2.20@2.55	large, \$2.50@3.20	(Victor; National; 1888 O. P.; Niagara; Clark O. P.; Clark's Tip; Buffalo.)	
Hickory Tanged Firmer, gro. ass'd. \$1.75@2.20	large, \$3.50@3.70	No.	1 3 5
Apple Socket Firmer, gro. ass'd. \$1.70@2.185	large, \$2.00@2.25	Doz. pair.....	\$0.75 1.45 2.90
Hickory Socket Firmer, gro. ass'd. \$1.60@2.175	large, \$2.15@2.00	Mortise Shutter:	
Hickory Socket Framing, gro. ass'd. \$2.20@2.75	large, \$2.68@2.85	(L. & P. O. S., Dixie, &c.)	
File, assorted.....	gro. \$1.00@2.15	No.	1 1 1/2 2 3 5
Hammer, Hatchet, Axe, &c.	60%	Doz. pair.....	\$0.60 .55 .55 .55
Not Varnished.....	55@80¢	Mortise Reversible Shutter, (Buffalo, &c.)	
Plane Handles:		No.	1 1 1/2 2
Jack, doz. 25¢; Jack Bolted.....	55@80¢	Doz. pair.....	\$0.65 .60 .55
Fore, doz. 55@33¢; Fore, Bolted.....		Parker.....	70@75%
		North's Automatic Blind Fixtures, No. 2 for Wood, \$9.00; No. 3, for Brick, \$11.50.....	105
Hangers —		Reading's Gravity.....	75@125
Barn Door, New Pattern, Round Groove, Regular:		Sargent's, Nos. 1, 3, 5.....	80@210@105
Inch.....	3 4 5 6 8 8	Sargent's, No. 11 & 18.....	70@105&10x5
Dos.	60.85 1.50 1.60 1.95 2.45	Wrightsville H'wdw Co.:	
		O. S. Lull & Porter.....	80@245
		Acme, Lull & Porter.....	75@105
		Queen City Reversible.....	75@105
		Stenger's Positive Locking, Nos. 1 & 3.....	70@105&5
		Shepard's No. 60, 65, 55.....	70@105
		Niagara, Gravity Locking, Nos. 1 & 5.....	75@745
		1988 Old Patn. Nos. 1, 3 & 5.....	75@745
		Tip Patn., Nos. 1, 3 & 5.....	75@745
		Buffalo Gravity Locking, Nos. 1, 3 & 5.....	75@745
		Shepard's Double Locking, Nos. 2 & 5.....	75@745
		Champion Gravity Locking, No. 73.....	75@745
		Steamboat Gravity Locking, No. 10.....	75@745
		Pioneer, Nos. 60, 45 & 54.....	75@745
		Empire, Nos. 101 & 103.....	70@745
		W. H. Co.'s Mortise Gravity Locking, No. 2.....	75@105
		Stanley's Steel Gravity Blind Hinges, \$1.00@2.50.....	30@105
		Gate Hinges—	
		Clark's or Shepard's—Doz. sets:	
		No.	1 2 3
		Hinges with Latches \$1.90 2.50 3.25	
		Hinges only.....	1.50 1.90 2.50

Ladies— Melting—		Style E, High Wheel....	70&10&5%
L. & G. Mfg. Co.	60s	Drexel and Gold Coin, low list....	50&5%
P. S. & W.	40&40&10%		
Reading—	50&10%		
Sargent's—	40&40&10%		
Lanterns— Tubular—			
Regular Tubular....	doz. \$4.50@\$.50		
Side Lift Tubular....	doz. \$4.75@\$.25		
Square Lift Tubular....	doz. \$4.75@\$.25		
Other Styles....	10c@10c@.40c@.50c		
Bull's Eye Police—			
No. 1, 3/4 inch.....	\$.35.00		
No. 2, 3 inch.....	\$.40.00		
Latches, Thumb—			
Roggins' Latches.....	doz. \$2@.25c		
Lawn Mowers—			
See Mowers, Lawn.			
Leaders, Cattle—			
Small.....	doz. 50c; large, 55c		
Cover Mfg. Co.	45&2%		
Lemon Squeezers—			
See Squeezers, Lemon.			
Lifters, Transom—			
Solid Grip, Payson Mfg. Co.....	.80c		
R & E.....	.45c		
Lines—			
Wire Clothes, Nos. 18 19 20			
100 feet.....	\$.90.00 2.00 1.65		
75 feet.....	\$.18.00 1.70 1.30		
Cessaw Mills			
Crown Solid Braided Chalk.....	.35&4%		
Mason's, No. 0 to No. 3.....	.35&4%		
Samson Cordage Works—			
Solid Braided Chalk, No. 0 to 3.....	.40c		
Silver Lake Braided Chalk, No. 0, .60c;			
No. 1, .60c; No. 2, .70c; No. 3, .75c			
8 gr.....	.05c		
Locks—			
Cabinet—			
Cabinet Locks.....	\$3.50@.35c@.75c		
Door Locks, Latches, &c.—			
[Net prices are very often made on these goods.]			
Reading Hardware Co.....	.40c		
R. & E. Mfg. Co.....	.50c		
Sargent & Co.....	40&40&10%		
Snow's Victor.....	.50c@.10c		
Elevator—			
Stowell's.....	.35&4%		
Padlocks—			
Wrought Iron.....	.75c@10@.80c		
R. & E. Mfg. Co. Wt. Steel and brass. 50%			
Sash, &c.—			
Fitch's Bronze and Brass.....	.65&4%		
Fitch's Irons.....	.70c		
Ives' Patent.....	.55c@.55c		
Payson's signals.....	.90c		
Reading.....	.60&10c@10c@.70c		
Machines—			
Boring—			
Without Augera.			
Upright. Angular.			
Improved No. 3, \$4.25	No. 1, \$5.00		
Improved No. 4, 3.75	No. 2, 3.35		
Jennings'.....	2.50		
Millers' Falls.....	5.75		
Snell's, Rice's Pat. 2.50	2.75		
Swan's, No. 500. 5.10 No. 200 0.45			
Hoisting—			
Moore's Anti-Friction Differential Pulley Block.....	.90c		
Moore's Hand Hoist, with Lock Brake. 30%			
Ice Cutting—			
Chandler's.....	.15c		
Washing—			
Wayne American, 1/2 doz. \$25.00	1/2 doz. \$25.00		
Western Star, No. 2, 1/2 doz.	25.00		
Western Star, No. 2, 1/2 doz.	20.00		
St. Louis, No. 41, 1/2 doz.	60.00		
Mallets—			
Hickory.....	.45c@.50c@.55c		
Lignumvitae.....	.45c@.50c@.55c		
Tinners', Hickory and Applewood, doz.....	.50@.65c		
Mats—			
Door—			
Elastic Steel (W. G. Co.).....	.10c		
Mattocks—			
See Picks and Mattocks.			
Meat Cutters—			
See Cutters, Meat.			
Milk Cans—			
See Cans, Milk.			
Mills— Coffee—			
Enterprise Mfg. Co.....	.25@.30c		
National, list Jan. 1, '94.....	.30c		
Parker's Columbian and Victor.....	.60&10c@.60c		
Parker's Box and Side.....	.50&10c@.60c		
Swift, Lane Bros.....	.30c		
Mincing Knives—			
See Knives, Mincing.			
Molasses Gates—			
See Gates, Molasses.			
Money Drawers—			
See Drawers, Money.			
Mowers, Lawn—			
Net prices are generally quoted.			
Cheap.....	all sizes \$1.80@.20		
Good.....	all sizes \$2.50@.25		
10 12 14 16-inch			
High Grade L.25 L.50	1.75 5.00		
Pennsylvania and Continental, 80&10c@.55c			
Quaker City.....	.70c@.5c		
Great American.....	.70c@.5c		
Philadelphia:			
Style M., S. C., K. T.....	.70&5c		
Style A, all Steel.....	.60@10%		
Style E, Low Wheel.....	.60@10%		
Nails—			
Out and Wire. See Trade Report.			
Wire Nails and Brads, Papered.			
List July 20, 1899.....	.85c@.85c@.75c@.10c		
Hungarian, Finishing, Upholsterers, &c. See Tacks			
Horse—			
No. 6 7 8 9 10			
A. C. 25c 23c 24c 21c 21c	.40&25c		
Ausable 24c 26c 25c 23c 20c	.50&10%		
Capewell 19c 18c 17c 16c 16c	.10c@.25c		
C. B. K. 25c 25c 24c 21c 21c	.40c		
Champ'ln 25c 25c 24c 24c 23c	.40c@.25c		
Clinto 1.19c 1.75c 1.6c 1.4c	.30@10c		
Hand 8 25c 23c 21c 21c 21c	.30c		
Neponset 23c 21c 20c 19c 18c	.40c		
Putnam 23c 21c 20c 19c 18c	.33&4c		
Vulcan 23c 21c 20c 19c 18c	.28&10%		
American, Nos. 1 to 10 & b.	.40@.14c		
Picture—			
1 1/2 2 2 1/2 3 3 1/2 in.			
Brass Head, 1/2 1/2 1/2 1/2 1/2 1/2 1/2 in.	.50 1.00 gro.		
Por. Head....	1.10 1.10 1.10 gro.		
Nippers, See Pliers and Nippers.			
Nut Crackers—			
See Crackers, Nut.			
Nuts—			
List Feb. 1, '99.			
Cold Punched			
Mfrs. or U. S. Standard, list.			
Hexagon, plain.....	5.60@.50c		
Square, plain.....	.50@.50c		
Square, C. T. & R.....	.50@.50c		
Hexagon, C. T. & R.....	.6.10@.6.30c		
Hot Pressed:			
Mfrs., U. S. or Nar. Gauge Stan'd.			
Square Blank or Tapped. 5.60@.50c			
Hexagon Blank or Tap'd. 6.30@.6.50c			
Oakum—			
Best or Government.....	lb. 64c		
Navy.....	lb. 5 c		
U. S. Navy.....	lb. 5 c		
Plumbers' Spun Navy.....	.54c		
In carload lots 1/4 lb. off f.o.b. New York.			
Oil, Axle—			
Snow Flake:			
1 pt. cans, per doz.....	\$.30.00		
1 qt. cans, per doz.....	\$.45.00		
1 gal. cans, per doz.....	\$.15.00		
5 gal. cans, per doz.....	\$.65.00		
Oil Tanks—See Tanks, Oil.			
Oilers—			
Brass and Copper.....	.10@.10@.50%		
Tin or Steel.....	.60@.10@.65%		
Zinc.....	.60@.10@.65%		
Malleable, Hammers' Improved, No. 1, \$3.60; No. 2, \$4; No. 3, \$4.40	W. doz. 20c		
Malleable, Hammers' Old Pattern, same list.....	.50@.10c		
Wilmot & Hobbs Mfg. Co:			
Spring Bottom Cans.....	.70@.70@.10c		
Railroad Oilers etc.....	.60@.60@.10c		
Openers—			
Can—			
French.....	.doz. 35c		
Iron Handle.....	.doz. 25@.27c		
Sprague, Iron Hdle., per doz 35@.40c			
Sardine Scissors, doz.....	.51.75@.52.00		
Top Tops.....	per doz. \$0.75		
National, 1/2 gro.....	.1.75@.2.00		
Stowell's, 1/2 gro.....	per doz. 40@.45		
Waldorf, 1/2 gro.....	.40.00		
Egg—			
Nickel Plate.....	per doz. \$2.00		
Silver Plate.....	per doz. \$4.00		
Packing—			
Rubber—			
Standard, fair quality....	.70@.10@.75%		
Inferior quality.....	.75@.10@.80%		
Extra.....	.60@.25@.60@.10c		
Jenkins' Standard, 1/2 doz. ....	.20@.25@.25c		
Miscellaneous—			
American Packing.....	.90@.10c lb.		
Cotton Packing.....	.13@.14c lb.		
Italian Packing.....	.10@.11c@.11c lb.		
Jute.....	.5%@.5c lb.		
Russia Packing.....	.12@.13c lb.		
Pails—			
Creamery—			
S. S. & Co., with gauges. No 1 \$0.50;			
No. 2, \$0.75	doz.		
Galvanized—			
Price per gro.			
Inch.....	10 12 14		
Water, Regular.....	21.00 21.00 24.00		
Water, Heavy.....	22.00 25.00 29.00		
Fire, Ed. Bottom.....	31.00 33.00 35.00		
Well.....	27.00 29.00 31.00		
Pans—			
Dripping—			
Standard List.....	.65@.10@.65%		
Fry—			
Common Lipped :			
No. 1 2 3 4 5 6 7			
Per doz. \$0.60 .75 .85 .95 1.15			
Roasting and Baking—			
Regal, S. S. & Co., 1/2 doz. Nos. 5, \$4.50;			
10-15 15-20 20-25 25-30 30-35 35-40			
Butcher's.....	.55.00@.55.25 to 2		
Stanley R. & L. Co., 50-10@.50@.10@.10c			
L. & J. W. White.....	.20@.25@.25c		
Platters, Corn, Hand—			
Kohler's Eclipse.....	.70c@.30@.10c@.5c		
Plates—			
Fellow.....	lb. 53@.54@.55c		
Self-Sealing Pie Plates (S. S. & Co.), 1/2 doz. \$3.00.....	.50c		
Pliers and Nippers—			
Button Pliers.....	.70c@.10@.75c		
Gas Burner, per doz., 5 in., \$1.15@.12.00; 6 in., \$1.55@.18.00			
Gas Pipe, 7 8 10 12 14 in.			
1.75 2.00 2.25 2.50 2.75			
Pulleys—			
Hay Fork, Swivel or Solid Eye.....			
Scranton, No. 1 and 2, 3/4 doz. ....	.28.00		
Scranton, No. 3, 1/2 doz. ....	.28.50		

PAINTS, OILS AND COLORS.—Wholesale Prices.

White Lead, Zinc, &c.	
Lead, Foreign white, in Oil.....	74¢ 9%
Lead, American, White, in Oil:	
Lots of 500 lb. or over.....	8¢ 6%
Lots less than 500 lb.	8¢ 7%
Lead, White, in oil, 25 lb. tin pails, add to keg price.....	8¢ 14%
Lead, White, in oil, 12½ lb. tin pails, add to keg price.....	8¢ 1
Lead, White, in oil, 1 to 5 lb. as- sorted tins, add to keg price.....	13¢
Lead, White, Dry in bbls.	84¢ 6
Lead, American. Terms: On lots of 500 lbs. and over, 60 days, or 5% for cash if paid in 15 days from date of invoice.	
Zinc, American, dry.....	7¢ 4¢ 6%
Zinc, Paris, Red Seal, dry.....	8¢ 8%
Zinc, Paris, Green Seal, dry.....	8¢ 9%
Zinc, Antwerp, Red Seal, dry.....	8¢ 6%
Zinc, Antwerp, Green Seal, dry.....	7¢ 7%
Zinc, V. M. French, in Poppy Oil, Green Seal:	
Lots of 1 ton and over.....	12 (13)¢
Lots of less than 1 ton.....	12 (13)¢
Zinc, V. M. French, in Poppy Oil, Red Seal:	
Lots of 1 ton and over.....	10¢ (11)¢
Lots of less than 1 ton.....	11 (11)¢
Discounts.—V. M. French Zinc.—Dis- counted to buyers of 10 bbls. lots of one or assorted grades, 1½ to 25 bbls., 2½ to 50 bbls., 4%.	
Dry Colors.	
Black, Carbon.....	7 3 8 90
Black, Drop, Amer.....	4 6 7
Black, Drop, Eng.....	7 11
Black, Ivory.....	12 31
Lamp, Com.....	4 16 6
Blue, Celestial.....	7 4 6
Blue, Chinese.....	30 35
Blue, Prussian.....	28 34
Blue, Ultramarine.....	4 20
Brown, Spanish.....	14 1
Brown, Vandyke, Amer.....	14 24
Brown, Vandyke, Foreign.....	24 31
Carmine, No. 40.....	7 30¢ 6¢ 75
Green, Chrome, ordinary.....	5 6 6
Green, Chrome, pure.....	18 29
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb. or over.....	8
Lots less than 500 lb.	8
Litharge, bbls., ½ bbls. and kegs:	
Lots 500 lb. or over.....	8
Lots less than 500 lb.	8
Ocher, French Washed.....	31.35¢ 2.26
Ocher, French Washed.....	4¢ 5
Ocher, American.....	7 ton 10.00¢ 15.00
Orange Mineral, English.....	7 8 90
Orange Mineral, French.....	11 3 16¢ 11
Orange Mineral, German.....	8 40 92
Orange Mineral, American.....	8 34
Red, Indian, English.....	4 6 6
Red, Indian, American.....	8 31
Red, Turkey, English.....	4 6 6
Red, Tuscan, English.....	7 110
Red, Venetian, Amer.	100 lb. 80¢ 1.75
Sienna, Italian, Burnt and Powdered.....	8 14¢ 74
Sienna, Ital. Raw, Powd.....	8 14¢ 74
Sienna, American, Raw.....	14¢ 2
Sienna, American, Burnt and Powdered.....	7 14¢ 2
Talc, French.....	7 100 lb. \$1.25 1.50
Talc, American.....	90 1.10
Terra Alba, French, 7 100 lb. .95 1.00	
Terra Alba, English.....	.95 1.00
Terra Alba, American No. 1.....	.85 .85
Terra Alba, American No. 2.....	.45 .50
Umber, Turkey, But. & Pow.	3 4¢ 84
Umber, Turkey, Raw & Powd.	3 4¢ 84
Umber, Bat. Amer.....	1 14¢ 2
Umber, Raw, Amer.....	1 14¢ 2
Yellow, Chrome.....	10¢ 35
Vermilion, American Lead.....	10 640
Vermilion, Quicksilver, bulk.....	.672
Vermilion, Quicksilver, bags.....	.73
Vermilion, English, Import.....	.50 .55
Vermilion, Chinese.....	\$.10.00 1.20
Colors in Oil.	
Black, Lampblack.....	19 14
Blue, Chinese.....	36 40
Blue, Prussian.....	32 38
Blue, Ultramarine.....	13 16
Animal, Fish and Vegeta- table Oils.	
Linseed, City, raw.....	7 gal. 61¢ 62
Linseed, City, boiled.....	63 64
Linseed, State and West'n, raw.....	60 65
Linseed, raw Calcutta seed.....	85
Lard, Prime.....	68 69
Lard, Extra No. 1.....	50 52
Lard, No. 1.....	41 43
Cotton-seed, Crude.....	31 33
Cotton-seed, Summer Yellow, prime.....	35 36
Cotton-seed Summer Yellow, off grades.....	38 39
Sperm, Crude.....	—
Sperm, Natural Spring.....	—
Sperm, Bleached Spring.....	—
Sperm, Natural Winter.....	41 63
Sperm, Bleached Winter.....	34 35
Whale, Crude.....	—
Whale, Natural Winter.....	—
Menhaden, Crude, Sound.....	58 59
Menhaden, Light Strained.....	39 43
Menhaden, Bleached Winter.....	35 36
Menhaden, Ex Bleached Winter.....	39 40
Tallow, prime.....	52 53
Cocoanut, Ceylon.....	54¢ 55
Cocoanut, Cochin.....	61¢ 62
Cod, Domestic.....	83 84
Cod, Newfoundland.....	35 37
Red Elaine.....	34 35
Red Saponified.....	47 48
Olive, Italian, bbls.....	60 65
Neatsfoot, prime.....	50 53
Palm, prime, Lagos.....	7 53¢ 6
Mineral Oils.	
Black, 20 gravity, 25 to 30 cold test.....	7 gal. 64¢ (10)
Black, 20 gravity, 10 cold test.....	10¢ (11)
Black, summer.....	9¢ 10
Cylinder, light filtered.....	14¢ (17)
Cylinder, dark filtered.....	11¢ (12)
Paraffine, 90-97 gravity.....	11¢ (12)
Paraffine, 90-97 gravity.....	11¢ (12)
Paraffine, 88 gravity.....	9¢ (11)
Paraffine, red, No. 1.....	12¢ (12)
In small lots 14¢ advance.....	

THE IRON AGE.

The oldest paper in the world devoted to the interests of the Hardware, Iron, Machinery and Metal Trades, and a standard authority on all matters relating to those branches of industry.

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CURRENT METAL PRICES.

APRIL 3, 1901.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL—
Bar Iron from Store—

Common Iron: Duty, Round, 0.6¢ per lb; Square, 0.8¢ per lb	
1 to 1½ in. round and square	per lb 1.75@1.85¢
1½ to 4 in. x ¾ to 1 in.	per lb 1.75@1.85¢
Refined Iron:	
1 to 1½ in. round and square	per lb 1.80@1.90¢
1½ to 4 in. x ¾ to 1 in.	per lb 1.90@2.00¢
1½ to 4 in. x 4 to 5-16	per lb 1.95@2.05¢
Rods—4 and 11-16 round and square. per lb 2.10@2.25¢	
Angles:	
3 in. x 1½ in. and larger	per lb 2.10¢
3 to 3½ in. x 3-16 in.	per lb 2.10¢
1½ to 3 in. x ¾ in.	per lb 2.05¢
1½ to 2½ in. x 3-16 in. and thicker	per lb 2.10¢
1 to 1½ in. x 1-16 in.	per lb 2.05¢
1 to 1½ in. x ¾ in.	per lb 2.05¢
1½ x ½ in.	per lb 2.05¢
2½ x ½ in.	per lb 2.05¢
3½ x ½ in.	per lb 2.05¢
4 x ½ in.	per lb 2.05¢
5 x ½ in.	per lb 2.05¢
6 x ½ in.	per lb 2.05¢
7 x ½ in.	per lb 2.05¢
Tees:	
1 in.	per lb 2.05¢
1½ in.	per lb 2.05¢
1½ in. and larger	per lb 2.05¢
Beams:	
Channels, 3 in. and larger	per lb 2.05¢
Bands—1½ to 6 x 3-16 to No. 8	per lb 2.05¢
"Burden's Best" Iron, base price	per lb 2.15¢
Burden's "H. B. & S." Iron, base price	per lb 2.05¢
"Ulster"	per lb 2.05¢
Norway Bars	per lb 3.00¢
Norway Shapes	per lb 3.00¢

Merchant Steel from Store—

Bessemer Machinery	per lb 1.90 to 1.95¢
Tee Calk, Tire and Sleigh Shoe	2.00@2.50¢
Best Cast Steel, base price in small lots	7½¢
Best Cast Steel Machinery, base price in small lots	8¢

Soft Steel Sheets—

54 inch	2.10¢ No. 14	2.80¢
3-16 inch	2.15¢ No. 16	2.90¢
No. 8	2.25¢ No. 18	3.00¢
No. 10	2.40¢ No. 20	3.40¢
No. 12	2.55¢ No. 22	3.50¢

Sheet Iron from Store.

Black.

One Pass, C. R. Soft Steel.	R. G. Cleaned.
Nos. 14 to 16	per lb 3.25
Nos. 18 to 21	per lb 3.35
Nos. 22 to 24	per lb 3.45
Nos. 25 and 26	per lb 3.55
No. 27	per lb 3.65
No. 28	per lb 3.75

Russia, Planished, &c.

Genuine Russia, according to assort-ment	per lb 1.00@1.05¢
Patent Planished	per lb A. 93¢; B. 94¢ net.

Galvanized.

Nos. 10 to 16	B. B. per lb 1.25¢
Nos. 17 to 21	1.35¢
Nos. 22 to 24	1.45¢
Nos. 25 to 28	1.55¢
No. 27	1.65¢
No. 28	1.75¢

56 in. 1½ lb higher.

Foreign Steel from Store—

Best Cast	per lb 15
Extra Cast	per lb 15@20
Swaged, Cast	per lb 15
Best Double Shear	per lb 15
Blister, 1st quality	per lb 13
German Steel, Best	per lb 10
2d quality	per lb 9
3d quality	per lb 8
Sheet Cast Steel, 1st quality	per lb 15
2d quality	per lb 14
3d quality	per lb 13
R. M. Muth's "Special"	per lb 45
" " " Annan	per lb 75
" " " " Titanic"	per lb 19
Hobson's Choice XX Extra Best	per lb 95
Jessop Self Hardening	per lb 45
Seaman's "Nelson" Steel	per lb 40
Hobson's "Soho" Special Self-Hardening	per lb 43

METALS—

Tin—

Duty—Pigs, Bars and Block. Free.	per lb 24¢@27¢
Bars, Pigs	24¢@27¢
Straits, Pigs	26¢@29¢

Straits in Bars

27¢@29¢

Tin Plates—

American Charcoal Plates.

Calland Grade: 10, 14 x 20 . . . . .	.65¢
12, 14 x 20 . . . . .	.65¢
Melvin Grade: 10, 14 x 20 . . . . .	.65¢
12, 14 x 20 . . . . .	.65¢
Allway Grade: 10, 14 x 20 . . . . .	.55¢
12, 14 x 20 . . . . .	.60¢

American Coke Plates—Bessemer—

10, 14 x 20	108¢
12, 14 x 20	105¢@106¢
10, 14 x 20	107.20@107.35¢

American Terne Plates—

10, 20 x 28 . . . . .	.55¢
12, 20 x 28	1.15¢

Tin Boiler Plates, American—

10, 14 x 20	112 sheets
12, 14 x 20	112 sheets
10, 14 x 31	112 sheets

Copper—

Dury, Pig, Bar and Ingot and Old Copper free Manufactured, 3¢@4¢ per lb.	per lb 45¢
Ingots—Lake	17¢@17.5¢

Ansonia grade Casting

16¢@17.5¢

Sheet and Bolt—

January 19, 1900.

Prices, in cents per pound.

Sheet to 60 in.

Net.

Sheet to 60 in.

per lb.

Common High Brass, in.	in.	in.	in.	in.	in.	in.	in.
Wider than and including	28	28	30	32	34	36	38
28	30	32	34	36	38	40	42
28	30	32	34	36	38	40	42
28	30	32	34	36	38	40	42

* Special prices not less than 80 cents.

Add 1¢@2¢ per lb additional for each number thinner than Nos. 28 to 35 inclusive. Discount from List

20¢

Wire in Cols. List February 26, 1896.

Brown & Sharpe's gauge the standard.

Com. high brass and

Gilding bronze and copper

All Nos. to No. 10, inclusive	\$0.23	\$0.27	\$0.28
Above No. 10 to No. 16	23½	27½	28½
No. 17 and No. 18	24	28	33
No. 19 and No. 20	25	29	33
No. 21	26	30	34
No. 22	27	31	35
No. 23	28	32	36
No. 24	29	33	37
No. 25	30	34	38
No. 26	31	35	39
No. 27	32	36	40
No. 28	33	37	41
No. 29	34	38	42
No. 30	35	39	43

Discount, Brass Wire, 20%; Copper Wire, Net.

List November 16, 98.

Spring Wire, 2¢ per lb advance.

Tobin Bronze—

Straight, but not turned, Rods, ½ in. diameter, 2¢ per lb.

Finished Piston Rods, ½ to 2½ in. diameter, 2¢ per lb.

Other sizes and extreme lengths, special prices.

Speleter—

Duty: In Blocks or Pigs, 1¢ per lb.

Western Speleter 4.45@4.65¢ |

Zinc.

Duty: Sheet, 2¢ per lb.

600 lb casks 2.74@2.75¢ |

Lead.

Duty: Pigs and Bars and Old, 2½¢ per lb. Pipe and Sheets, 3½¢ per lb.

American Pipe 4.60@4.82¢ |Pipes 5¢@5.5¢ |Tin Lined Pipe 12.4¢@12.5¢ |Block Tin Pipe 10¢@10.5¢ |Sheet Lead, full round 7¢@7.5¢ |Sheet Lead, cut 7.5¢@8¢ |

Old Lead in exchange, 4.6¢ per lb.

Solder.

14 & 16 guaranteed 18@18.5¢ |No. 1 14.4@14.5¢ |

Prices of Solder indicated by private brand vary according to composition.

Antimony—

Duty, ½ lb 9¢ per lb.

Cookson 9¢@10¢@11¢ |Hallott's 9¢@9.5¢@10.5¢ |U. S. 9¢@9.5¢@10.5¢ |

No. 1 Aluminum (guaranteed over 99% pure), in ingots for remelting:

Small lots 9¢@9.5¢ |100-lb lots 9.5¢@10¢ |

No. 2 Aluminum (guaranteed to be over 99% pure), in ingots for remelting:

Small lots 9¢@9.5¢ |

